REQUEST FOR QUALIFICATIONS
No. 24-TA005084SAM
PROFESSIONAL ENGINEERING SERVICES FOR SOUTHEAST WATER RECLAMATION FACILITY ELECTRICAL M1 & M2 SWITCHGEAR REPLACEMENT
PROJECT NO. 6110182
DECEMBER 7, 2023

Manatee County BCC
Procurement Division
1112 Manatee Avenue West, 7th Floor, Suite 705
Bradenton, FL 34205
purchasing@mymanatee.org

ADVERTISEMENT
REQUEST FOR QUALIFICATIONS NO. 24-TA005084SAM
PROFESSIONAL ENGINEERING SERVICES SOUTHEAST WATER RECLAMATION FACILITY M1 & M2 SWITCHGEAR REPLACEMENT

Manatee County, a political subdivision of the State of Florida (hereinafter referred to as County) will receive qualification proposal responses (Proposals) from individuals, corporations, partnerships, and other legal entities authorized to do business in the State of Florida (Proposers), to provide professional engineering services as specified in this Request for Qualifications.

DATE, TIME AND PLACE DUE:
The Due Date and Time for submission of Proposals in response to this RFQ **is February 15, 2024 by 2:00 PM ET.** Proposals must be delivered to the following location: Manatee County Administration Building, 1112 Manatee Ave. W., 7th Floor, Suite 705, Bradenton, FL 34205 and time stamped by a Procurement representative by the Due Date and Time. Proposals will be opened immediately following the Due Date and Time at the Manatee County Administration Building, 7th Floor, Suite 705.

SOLICITATION INFORMATION CONFERENCE:
A non-mandatory Information Conference will be held at 9:00 AM ET on January 5, 2024 at the Manatee County Public Works Building, 1022 26th Ave. E., Bradenton, FL 34208.

DEADLINE FOR QUESTIONS AND CLARIFICATION REQUESTS:
The deadline to submit all questions, inquiries, or requests concerning interpretation, clarification or additional information pertaining to this Request for Qualifications to the Manatee County Procurement Division is January 16, 2024. Questions and inquiries should be submitted via email to the Designated Procurement Contact shown below.

Important: A prohibition of lobbying is in place. Review Section A.13 carefully to avoid violation and possible sanctions.

DESIGNATED PROCUREMENT CONTACT: Sherri Meier, Procurement Manager - Construction
(941) 749-3042, Fax (941) 749-3034
Email: sherri.adamsmeier@mymanatee.org
Manatee County Financial Management Department
Procurement Division

AUTHORIZED FOR RELEASE: Jacob Erickson, MBA, CPPO, NIGP-CPP

Digitally signed by Jacob Erickson, MBA, CPPO, NIGP-CPP
Date: 2023.12.06 15:06:27 -05'00'

TABLE OF CONTENTS

SECTION A, INSTRUCTIONS TO PROPOSERS

In order to receive consideration, Proposers must meet the minimum qualification requirements, submit the required forms and information, and comply with the instructions as follows. Proposals will be accepted from a single business entity, joint venture, partnership or corporation. The County intends to award an agreement(s) for the provision of professional engineering services as identified in this RFQ.

A.01 INFORMATION CONFERENCE AND SITE VISIT

A non-mandatory Information Conference will be held at 9:00 AM ET on January 5, 2024 at the Manatee County Public Works Building, 1022 26th Ave. E., Bradenton, FL 34208.

A non-mandatory site tour will be held at 11:00 AM ET on January 5, 2024 at the Southeast Water Reclamation Facility, 3333 Lena Road, Bradenton, FL 34221.

Attendance to the information conference and site visit is not mandatory, but is strongly encouraged.

A.02 DUE DATE AND TIME

The Due Date and Time for submission of Proposals in response to this Request for Qualifications (RFQ) **is February 15, 2024 by 2:00 PM ET.** Proposals must be delivered to the following location: Manatee County Administration Building, 1112 Manatee Ave. W., 7th Floor, Suite 705, Bradenton, FL 34205 prior to the Due Date and Time.

Proposal(s) received after the Due Date and Time will not be considered. It will be the sole responsibility of the Proposer to deliver its Proposal to the Manatee County Procurement Division for receipt on or before the Due Date and Time. If a Proposal is sent by U.S. Mail, courier or other delivery services, the Proposer will be responsible for its timely delivery to the Procurement Division. Proposals delayed in delivery will not be considered, will not be opened at the public opening, and arrangements will be made for their return at the Proposer's request and expense.

A.03 PUBLIC OPENING OF RESPONSES

Sealed Proposals will be publicly opened at Manatee County Administration Procurement Division, 1112 Manatee Avenue West, 7th Floor, Suite 705, Bradenton, Florida 34205, in the presence of County officials immediately upon expiration of the Due Date and Time. Proposers or their representatives may attend the Proposal opening.

Manatee County will make public at the opening the names of the business entities which submitted a Proposal and city and state in which they reside. No review or analysis of the Proposals will be conducted at the Proposal opening.

A.04 SUBMISSION OF RESPONSES

The contents of the Proposal sealed package must include:

- One (1) bound original clearly identifying Proposer and marked “ORIGINAL”.
- Three (3) bound copy(s) clearly identifying Proposer and marked “COPY” with all required information and identical to the original.
- One (1) electronic format copy(s) clearly identifying Proposer.

Electronic format copies should be submitted on separate Universal Serial Bus (USB) portable flash memory drives or compact disc (CD) in MicroSoft Office® or Adobe Acrobat® portable document format (PDF) in one continuous file. Do not password protect or otherwise encrypt electronic Proposal copies. Electronic copies must contain an identical Proposal to the original.

Upon submission, all Proposals become the property of Manatee County which has the right to use any or all ideas presented in any Proposal submitted in response to this Request for Qualifications whether, or not, the Proposal is accepted.

Submit the Proposal package in a sealed container with the following information clearly marked on the outside of the package: RFQ No. 24-TA005084SAM, Professional Engineering Services for Southeast Water Reclamation Facility M1 & M2 Switchgear Replacement, Proposer’s name, and Proposer’s address. Proposals must be received by the Manatee County Procurement Division prior to the Due Date and Time at the following address:

Manatee County
Procurement Division
1112 Manatee Avenue West, 7th Floor, Suite 705
Bradenton, FL 34205

A.05 ORGANIZATION OF RESPONSES

Proposals must be organized and arranged with tabs in the same order as listed in the subsections within Exhibit 2, Proposal Response, identifying the response to each specific item.

Proposals must clearly indicate the legal name, address and telephone number of the Proposer. Proposal Signature Form must be signed by an official or other individual authorized to make representations for the Proposer.

A.06 DISTRIBUTION OF SOLICITATION DOCUMENTS

All documents issued pursuant to this RFQ are distributed electronically and available for download at no charge at www.mymanatee.org > *Business* > *Bids and Proposals.* Documents may be viewed and downloaded for printing using Adobe Reader® or Microsoft software, as applilcable.

At its sole discretion, the County may utilize a third-party provider to distribute Proposals. For more information regarding this service visit the Procurement webpage of the County website. Utilization of this third-party service is not a requirement for doing business with Manatee County.

Additionally, the RFQ and all related documents are available for public inspection at the Manatee County Procurement Division, 1112 Manatee Avenue West, 7th Floor, Suite 705, Bradenton, FL 34205. Call (941) 749-3014 to schedule an appointment. Documents are available between the hours of 8:00 A.M. and 5:00 P.M., Monday through Friday, with the exception of County holidays.

As a courtesy, Manatee County notifies the Manatee County Chamber of Commerce and the Manasota Black Chamber of Commerce of all active solicitations, who then distributes the information to its members.

A.07 ADDENDA

Any interpretations, corrections or changes to this RFQ will be made by addendum. Addenda will be posted on the Procurement Division's web page of the County website at http://www.mymanatee.org/> *Business* > *Bids and Proposals*. For those solicitations that are advertised on a third-party website, addenda will likewise be posted on the third-party website.

All addenda are a part of the RFQ and each Proposer will be bound by such addenda. It is the responsibility of each Proposer to obtain, read and comprehend all addenda issued. Failure of any Proposer to acknowledge an issued addendum in its Proposal will not relieve the Proposer from any obligation contained therein.

A.08 RESPONSE EXPENSES

All costs incurred by Proposer in responding to this RFQ and to participate in any interviews/presentations/demonstrations, including travel, will be the sole responsibility of the Proposer.

A.09 QUESTION AND CLARIFICATION PERIOD

Each Proposer shall examine all RFQ documents and will judge all matters relating to the adequacy and accuracy of such documents. Any questions or requests concerning interpretation, clarification or additional information pertaining to this RFQ shall be made in writing via email to the Manatee County Procurement Division to the Designated Procurement Contact or to purchasing@mymanatee.org. All questions received and responses given will be provided to potential Proposers via an addendum to this RFQ

Manatee County will not be responsible for oral interpretations given by other sources including County staff, representative, or others. The issuance of a written addendum by the Procurement Division is the only official method whereby interpretation, clarification or additional information will be given.

A.10 FALSE OR MISLEADING STATEMENTS

Proposals which contain false or misleading statements, or which provide references which do not support an attribute or condition claimed by the Proposer, may be rejected. If, in the opinion of the County, such information was intended to mislead the County in

its evaluation of the Proposal, and the attribute, condition or capability is a requirement of this RFQ. Such Proposer will be disqualified from consideration for this RFQ and may be disqualified from submitting a response on future solicitation opportunities with the County.

A.11 WITHDRAWAL OR REVISION OF RESPONSES

Proposers may withdraw Proposals under the following circumstances:

a. If Proposer discovers a mistake(s) prior to the Due Date and Time. Proposer may withdraw its Proposal by submitting a written notice to the Procurement Division. The notice must be received in the Procurement Division prior to the Due Date and Time for receiving Proposals. A copy of the request shall be retained, and the unopened Proposal returned to the Proposer; or

b. After the Proposals are opened but before a contract is signed, Proposer alleges a material mistake of fact if:

    1. The mistake is clearly evident in the solicitation document; or
    2. Proposer submits evidence which clearly and convincingly demonstrates that a mistake was made in the Proposal. Request to withdraw a Proposal must be in writing and approved by the Purchasing Official.

A.12 JOINT VENTURES

Proposers intending to submit a Proposal as a joint venture with another entity are required to have filed proper documents with the Florida Department of Business and Professional Regulation and all other State or local licensing agencies as required by Florida Statute Section 489.119, prior to the Due Date and Time.

A.13 LOBBYING

After the issuance of any solicitation, no prospective Proposer, or their agents, representatives or persons acting at the request of such Proposer, shall contact, communicate with or discuss any matter relating in any way to the solicitation with any County officers, agents or employees, other than the Purchasing Official or designee, unless otherwise directed by the Purchasing Official or designee. This prohibition includes copying such persons on written communications (including email correspondence) but does not apply to presentations made to evaluation committees or at a County Commission meeting where the Commission is considering approval of a proposed contract/purchase order. This requirement ends upon final execution of the contract/purchase order or at the time the solicitation is cancelled. Violators of this prohibition will be subject to sanctions as provided in the Manatee County Code of Ordinances Section 2-26-31 and 2-26-32. Sanctions may include (a) written warning; (b) termination of contracts; and (c) debarment or suspension.

A.14 EXAMINATION OF RESPONSES

The examination and evaluation of the Proposals submitted in response to this solicitation generally requires a period of not less than ninety (90) calendar days from the Due Date and Time.

A.15 ERRORS OR OMISSIONS

Once a Proposal is opened, the County will not accept any request by Proposer to correct errors or omissions in the Proposal other than as identified in paragraph A.11.

A.16 DETERMINATION OF RESPONSIBLENESS AND RESPONSIVENESS

The County will conduct a due diligence review of all Proposals received to determine if the Proposer is responsible and responsive.

To be responsive a Proposer must submit a Proposal that conforms in all material respects to the requirements of this RFQ and contains all the information, fully completed attachments and forms, and other documentation required. Proposals that are deemed non-responsive will not be considered or evaluated.

To be responsible, a Proposer must meet the minimum qualification requirements and have the capability to perform the Scope of Services contained in this RFQ. Proposals submitted by Proposers that are deemed non-responsible will not be considered or evaluated.

A.17 RESERVED RIGHTS

The County reserves the right to accept or reject any and all Proposals, to waive irregularities and technicalities, to request additional information and documentation, and to cancel this solicitation at any time prior to execution of the contract. In the event only one Proposal is received, the County reserves the right to negotiate with the Proposer. The County reserves the right to award the contract to a responsive and responsible Proposer which in its sole determination is the best value and in the best interests of the County.

The County reserves the right to conduct an investigation as it deems necessary to determine the ability of any Proposer to perform the work or service requested. Upon request by the County, Proposer shall provide all such information to the County. Additional information may include, but will not be limited to, current financial statements prepared in accordance with generally accepted accounting practices and certified by an independent CPA or official of Proposer; verification of availability of equipment and personnel; and past performance records.

A.18 APPLICABLE LAWS

Proposer must be authorized to transact business in the State of Florida. All applicable laws and regulations of the State of Florida and ordinances and regulations of Manatee County will apply to any resulting contract. This solicitation process will be conducted in accordance with Manatee County Code of Ordinances, Chapter 2-26.

A.19 TAXES

Manatee County is exempt from Federal Excise and State Sales Taxes. (F.E.T. Cert. No. 59-78-0089K; Florida Sales Tax Exempt Cert. No. 85-8012622206C-6). Therefore, the Proposer is prohibited from delineating a separate line item in its Proposal for any sales or service taxes.

The Successful Proposer will be responsible for the payment of taxes of any kind, including but not limited to sales, consumer, use, and other similar taxes payable on account of the work performed and/or materials furnished under the award in accordance with all applicable laws and regulations.

A.20 SCRUTINIZED COMPANIES

Pursuant to Florida Statute Section 287.135, as of July 1, 2012, a company that, at the time of submitting a response for a new contract or renewal of an existing contract, is on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, created pursuant to Florida Statute Section 215.473, is ineligible for, and may not submit a response for or enter into or renew a contract with an agency or local governmental entity for goods or services of $1 million or more.

A.21 COLLUSION

Proposer certifies that its Proposal is made without prior understanding, agreement, or connection with any other corporation, firm or person submitting a Proposal for the same materials, services, supplies, or equipment and is in all respects fair and without collusion or fraud.

Any such violation may result in contract cancellation, return of materials or discontinuation of services and the possible removal of Proposer from participation in future County solicitations for a specified period.

The County reserves the right to disqualify a Proposer during any phase of the solicitation process and terminate for cause any resulting contract upon evidence of collusion with intent to defraud on the part of the Proposer.

A.22 CODE OF ETHICS

With respect to this Request for Qualifications, if any Proposer violates, directly or indirectly, the ethics provisions of the Manatee County Procurement Code and/or Florida criminal or civil laws related to public procurement, including but not limited to Florida Statutes Chapter 112, Part II, Code of Ethics for Public Officers and Employees, such Proposer will be disqualified from eligibility to perform the work described in this RFQ, and may also be disqualified from submitting any future bids or proposals to supply goods or services to Manatee County.

A.23 PUBLIC ENTITY CRIMES

In accordance with Section 287.133, Florida Statutes, a person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may

not submit a proposal on a contract to provide any goods or services to a public entity, may not submit a proposal on a contract with a public entity for the construction or repair of a public building or public work, may not submit proposals on leases or real property to a public entity, may not be awarded or perform work as a contractor, Successful Proposer, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017 for Category Two for a period of 36 months from the date of being placed on the convicted vendor list.

In addition, Manatee County Code of Laws Chapter 2-26 Article V prohibits the award of County contracts to any person or entity who/which has, within the past 5 years, been convicted of, or admitted to in court or sworn to under oath, a public entity crime or of any environmental law that, in the reasonable opinion of the Purchasing Official, establishes reasonable grounds to believe the person or business entity will not conduct business in a reasonable manner.

To ensure compliance with the foregoing, Manatee County Code of Laws requires all persons or entities desiring to contract with Manatee County to execute and file with the Purchasing Official an affidavit, executed under the pain and penalties of perjury, confirming that person, entity, and any person(s) affiliated with the entity, does not have such a record and is therefore eligible to seek and be awarded business with Manatee County. Proposer is to complete Form 3 and submit with your Proposal.

A.24 AMERICANS WITH DISABILITIES

Manatee County does not discriminate upon the basis of any individual's disability status. This non-discrimination policy involves every aspect of County's functions including one's access to participation, employment, or treatment in its programs or activities. Anyone requiring reasonable accommodation for an information conference or Proposal opening should contact the person named on the cover page of this document at least twenty-four (24) hours in advance of either activity.

A.25 EQUAL EMPLOYMENT OPPORTUNITY

In accordance with Title VI of the Civil Rights Act of 1964, Title 15, Part 8 of the Code of Federal Regulations and the Civil Rights Act of 1992, Manatee County hereby notifies all Proposers that it will affirmatively ensure minority business enterprises are afforded full opportunity to participate in response to this Request for Qualifications and will not be discriminated against on the grounds of race, color, national origin, religion, sex, age, handicap, or marital status in consideration of award.

A.26 MINORITY AND/OR DISADVANTAGED BUSINESS ENTERPRISE

The State of Florida Office of Successful Proposer Diversity provides the certification process and maintains the database of certified MBE/DBE firms. Additional information may be obtained at http://www.osd.dms.state.fl.us/iframe.htm or by calling (850) 487-0915.

A.27 DISCLOSURE

Upon receipt, all inquiries and responses to inquiries related to this Request for Proposal become "Public Records", and shall be subject to public disclosure consistent with Florida Statute, Chapter 119.

Proposals become subject to disclosure thirty (30) days after the opening or if a notice of intent to award decision is made earlier than this time as provided by Florida Statutes § 119.071(1)(b). No announcement or review of the Proposals shall be conducted at the public opening.

If County rejects all Proposals and concurrently notices its intent to reissue the solicitation, the rejected Proposals are exempt from public disclosure until such time the County provides notice of an intended decision concerning the reissued solicitation or until County withdraws the reissued solicitation. A Proposal is not exempt for longer than twelve (12) months after the initial notice of rejection of all Proposals.

Pursuant to Florida Statute 119.0701, to the extent Successful Proposer is performing services on behalf of County, Successful Proposer must:

a. Keep and maintain public records required by public agency to perform the service. That information and data it manages as part of the services may be public record in accordance with Chapter 119, Florida Statutes and Manatee County public record policies. Proposer agrees, prior to providing goods/services, it will implement policies and procedures, which are subject to approval by County, to maintain, produce, secure, and retain public records in accordance with applicable laws, regulations, and County policies including but not limited to Section 119.0701, Florida Statutes.

b. Upon request from the public agency's custodian of public records, provide the public agency with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Florida Statutes, Chapter 119, or as otherwise provided by law.

c. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the Successful Proposer does not transfer the records to the public agency.

d. Upon completion of the contract, transfer, at no cost, to the public agency all public records in possession of contractor or keep and maintain public records required by the public agency to perform the service. If the Successful Proposer transfers all public records to County upon completion of the contract, the Successful Proposer shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Successful Proposer keeps and maintains public records upon completion of the contract, the Successful Proposer shall meet all applicable requirements for retaining public records. All records stored

electronically must be provided to County, upon request from County's custodian of public records, in a format that is compatible with the information technology systems of County.

IF THE SUCCESSFUL PROPOSER HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO ITS DUTY TO PROVIDE PUBLIC RECORDS RELATING TO ANY RESULTING CONTRACT, CONTACT COUNTY'S CUSTODIAN OF PUBLIC RECORDS AT:

PHONE: (941) 742-5845
EMAIL: LACY.PRITCHARD@MYMANATEE.ORG
ATTN: RECORDS MANAGER
1112 MANATEE AVENUE WEST
BRADENTON, FL 34205

A.28 TRADE SECRETS

Manatee County is subject to Chapter 119, Florida Statutes. Therefore, all documents, materials, and data submitted as part of a Proposal in response to a Request for Proposal are governed by the disclosure, exemption and confidentiality provisions relating to public records in Florida Statutes.

Notwithstanding any other provision in this solicitation, designation of the entire proposal as 'trade secret', 'proprietary', or 'confidential' is not permitted and may result in a determination that the Proposal is non-responsive and therefore the proposal will not be evaluated or considered.

Except for materials that are 'trade secrets' as defined by Chapter 812, Florida Statutes, ownership of all documents, materials and data submitted as part of a Proposal in response to the Request for Proposal shall belong exclusively to County.

To the extent that Proposer desires to maintain the confidentiality of materials that constitute trade secrets pursuant to Florida law, trade secret material submitted must be segregated from the portions of the Proposal that are not declared as trade secret. In addition, Proposer shall cite, for each trade secret claimed, the Florida Statute number which supports the designation. Further, Proposer shall offer a brief written explanation as to why the cited Statute is applicable to the information claimed as trade secret. Additionally, Proposer shall provide a hard copy of its Proposal that redacts all information designated as trade secret.

In conjunction with trade secret designation, Proposer acknowledges and agrees that:

a. Trade secret requests made after the opening will not be considered. However, County reserves the right to clarify the Proposers request for trade secret at any time; and
b. County and its officials, employees, agents, and representatives are hereby granted full rights to access, view, consider, and discuss the information designated as trade secret throughout the evaluation process and until final execution of any awarded purchase order or contract; and
c. That after notice from County that a public records request has been made pursuant to Proposer's proposal, the Proposer at its sole expense, shall be responsible for defending its determination that submitted material is a trade secret and is not subject to disclosure. Action by Proposer in response to notice from the County shall be taken immediately, but no later than 10 calendar days from the date of notification or Proposer will be deemed to have waived the trade secret designation of the materials.

Proposer shall indemnify and hold County, and its officials, employees, agents and representatives harmless from any actions, damages (including attorney's fees and costs), or claims arising from or related to the designation of trade secrets by the Proposer, including actions or claims arising from County's non-disclosure of the trade secret materials.

A.29 CONFIDENTIALITY OF SECURITY RELATED RECORDS

a. Pursuant to Florida Statutes § 119.071(3), the following records (hereinafter referred to collectively as "the Confidential Security Records") are confidential and exempt from the disclosure requirements of Florida Statutes § 119.07(1):

    1. A Security System Plan or portion thereof for any property owned by or leased to County or any privately owned or leased property held by County.

    2. Building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a building, arena, stadium, water treatment facility, or other structure owned or operated by County.

    3. Building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout or structural elements of an attractions and recreation facility, entertainment or resort complex, industrial complex, retail and service development, office development, or hotel or motel development in the possession of, submitted to County.

b. Successful Proposer agrees that, as provided by Florida Statute, it shall not, as a result of a public records request, or for other reason disclose the contents of, or release or provide copies of the Confidential Security Records to any other party absent the express written authorization of County's Property Management Director or to comply with a court order requiring such release or disclosure. To the extent

Successful Proposer receives a request for such records, it shall immediately contact the County's designated Contract administrator who shall coordinate County's response to the request.

A.30 E-VERIFY

Prior to the employment of any person under this contract, the Successful Proposer shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of (a) all persons employed during the contract term by the Successful Proposer to perform employment duties within Florida and (b) all persons, including subcontractors, assigned by the Successful Proposer to perform work pursuant to the contract with Manatee County. For more information on this process, please refer to United States Citizenship and Immigration Service site at: http://www.uscis.gov/.

Only those individuals determined eligible to work in the United States shall be employed under this contract.

By submission of a Proposal in response to this RFQ, the successful Proposer commits that all employees and subcontractors will undergo e-verification before placement on this contract.

The successful Proposer shall maintain sole responsibility for the actions of its employees and subcontractors. For the life of the contract, all employees and new employees brought in after contract award shall be verified under the same requirement stated above.

A.31 LICENSES AND PERMITS

The successful Proposer shall be solely responsible for obtaining all necessary license and permit fees, including, but not limited to, all license fees, permit fees, impact fees, or inspection fees, and responsible for the costs of such fees. Successful Proposer is solely responsible for ensuring all work complies with all Federal, State, local, and Manatee County ordinances, orders, codes, laws, rules, regulations, directives, and guidelines.

A.32 MINIMUM WAGE REQUIREMENTS

The successful Proposer shall comply with all minimum wage requirements, such as Living Wage requirements, minimum wages based on Federal Law, minimum wages based on the Davis-Bacon Act, and the provisions of any other employment laws, as may be applicable to the Agreement.

A.33 PROTEST

Any actual bidder, Proposer, or contractor who is aggrieved in connection with the notice of intent to award of a contract with a value greater than $250,000 where such grievance is asserted to be the result of a violation of the requirements of the Manatee County Procurement Code or any applicable provision of law by the officers, agents, or employees of the County, may file a protest to the Purchasing Official.

Protest must be in writing and delivered via email at purchasing@mymanatee.org or by hand delivery to the Procurement Division at 1112 Manatee Avenue West, 7th Floor, Suite 705, Bradenton, FL 34205 by 5:00 p.m. on the fifth business day following the date of posting of the Notice of Intent to Award on the County website. There is no stay of the procurement process during a protest. The Purchasing Official shall have the authority to settle and resolve a protest concerning the intended award of a contract.

For additional information regarding the County protest process, visit the Procurement Division webpage on the County website.

A.34 BINDING OFFER

Proposals will remain valid for a period of 120 days following the Due Date and Time and will be considered a binding offer to perform the required services and/or provide the required goods. The submission of a Proposal will be taken as prima facie evidence that the Proposer has familiarized itself with the contents of this Solicitation

A.35 ACCESSIBILITY

The County is committed to making its documents and information technologies accessible to individuals with disabilities by meeting the requirements of Section 508 of the Rehabilitation Act and best practices (W3C WCAG 2). **For assistance with accessibility regarding this solicitation, contact the Manatee County Procurement Division via email at purchasing@mymanatee.org or by phone at 941-748-4501, X3014.**

Successful Proposer shall ensure all its electronic information, documents, applications, reports, and deliverables required in the proposal are in a format that meets the requirements of Section 508 of the Rehabilitation Act and best practices (W3C WCAG 2).

Where not fully compliant with these requirements and best practices, Successful Proposer shall provide clear points of contact for each document and information technology to direct users in how to obtain alternate formats. Further, Successful Proposer shall develop accommodation strategies for those non-compliant resources and implement strategies to resolve the discrepancies.

A.36 SOLICITATION SCHEDULE

The following schedule has been established for this Solicitation process. Refer to the County's website (www.mymanatee.org > *Business* > *Bids & Proposals*) for meeting locations and updated information pertaining to any revisions to this schedule.

Scheduled Item	**Scheduled Date**
Non-Mandatory Solicitation Information Conference and Site visit will be conducted in accordance with Article A.01.	January 5, 2024, 9:00 AM ET & 11:00 AM ET respectivly

Question and Clarification Deadline	January 16, 2024
Proposal due Date and Time	February 15, 2024, by 2:00 PM ET
Technical Evaluation Meeting	TBD
Technical Evaluation Meeting	TBD
Interviews/Presentations/Demonstrations (if conducted)	TBD
Final Evaluation Meeting (if required)	TBD
Projected Award	May 2024

END SECTION A

SECTION B, EVALUATION OF RESPONSES

B.01 EVALUATION

A due diligence review will be conducted to determine if the Proposal is responsive to the submission requirements outlined in this Solicitation and to determine if the Proposer is a responsible Proposer.

A responsive Proposal is one that follows the requirements of this Solicitation, includes all documentation, is submitted in the format outlined in this Solicitation, is of timely submission, and has the appropriate signatures as required on each document. Failure to comply with these requirements may result in the Proposal being deemed non-responsive. A responsible Proposer is a Proposer which the County affirmatively determines has the ability, capability and skill to perform under the terms of the agreement; can provide the materials and/or service promptly within the time specified, without delay or interference; has a satisfactory record of integrity and business ethics; and meets the minimum qualification requirements in this RFQ.

Evaluation of Proposals will be conducted by an evaluation committee. Each evaluation committee member will evaluate and score the Proposals for each of the evaluation criteria. The committee will consider all information submitted by each responsible and responsive Proposer; clarification information provided by Proposer; information obtained during the interviews, presentations, or demonstrations; feedback received from Proposer's references; and any other relevant information received during any investigation of Proposer to ascertain the ability of the Proposer to perform the Scope of Services as stated in this RFQ.

B.02 EVALUATION CRITERIA

The following evaluation criteria have been established for this RFQ.

Evaluation Criteria	Maximum Points
Proposer & Team's Experience	25
Approach to Engineering Services	30
Organizational Structure and Capacity	25
Similar Completed Projects	20

B.03 CLARIFICATIONS, INTERVIEWS, PRESENTATIONS, DEMONSTRATIONS

As part of the evaluation process, the evaluation committee will determine a list of those responsive and responsible Proposals that are deemed by the committee as having a reasonable probability of being selected for award (Short List). At a minimum, the evaluation committee shall conduct discussions with the Short List Proposers and may request additional information or clarification from Proposers for the purpose of further evaluation of (a) conformance to the solicitation requirements, (b) the abilities of the Proposer, and (c) understanding of the Proposal submitted. Additional information and clarification must be submitted by Proposer within the requested time-period.

Additionally, interviews, presentations or demonstrations may be conducted with Proposers as part of the evaluation process. If conducted, the Short List Proposers will be invited to meet with the committee. The information gained from these interviews, presentations, or demonstrations will be part of the committee's consideration in making a recommendation for award. Therefore, Proposers should make arrangements to attend, if invited.

The interviews, presentations and demonstrations are closed to the public to the extent permitted by law.

In the final evaluations, each evaluator will consider the information obtained from the proposals as well as the discussions and clarifications presented during the presentations. As part of the final evaluations, the initial technical evaluation scores for each short-listed firm, in each of the evaluation criterion, will be discussed by the evaluation committee and are subject to change.

B.04 RECOMMENDATION FOR NEGOTIATION

The evaluation committee will determine from the responses to this RFQ and subsequent investigations, the Proposer(s) who best meets the County's requirements. Upon completion of the technical evaluations, the evaluation committee will make a recommendation as to the Proposer(s) which the County should enter into negotiations, if any. The County will notice the Intent to Negotiate, in the same manner the original Request for Qualifications document was noticed prior to commencing negotiations.

Upon approval to commence negotiations, the recommended Proposer(s) shall submit one original hard copy and one electronic copy on a CD or USB flash drive of its pricing proposal. The pricing information should show a categorical breakout of the pricing, with any alternates or options clearly identified. The pricing information shall be clear and unambiguous to facilitate evaluation of the prices submitted.

The County will conduct negotiations with the highest scoring Proposer. If the County and the highest-scored Proposer cannot reach agreement on a contract, the County reserves the right to terminate negotiations and may, at its sole discretion, begin negotiations with the next highest-scored Proposer(s). This process may continue until a contract acceptable to the County has been negotiated or all Proposals are rejected.

B.05 RECOMMENDATION FOR AWARD

Upon successful completion of negotiations, a recommendation for award to the successful Proposer(s) will be presented for approval per County ordinances, policies and procedures.

END SECTION B

SECTION C, AWARD OF THE AGREEMENT

C.01 GENERAL

By submitting a Proposal, Proposer understands and agrees:

a. The Proposal and all subsequent information requested by the County during the procurement process will serve as a basis for the Agreement.
b. All products and papers produced during the Agreement period become the property of Manatee County upon termination or completion of the engagement.

C.02 AGREEMENT

The successful Proposer(s) will be required to execute the Agreement in a form and with provisions acceptable to the County (See Exhibit 4, Sample Agreement). The County (as Owner) will execute this Agreement with the successful Proposer (as Consultant).

The negotiated Agreement may or may not include all elements of this RFQ or the Proposal submitted by the successful Proposer(s) where alternatives provide best value, are desirable to the County, and the parties agree to such terms. Negotiations of the terms of the Agreement, may include specifications, scope of project, price, the Agreement period, renewal, or any other relevant provisions.

C.03 AWARD

County does not make award to a Proposer who is delinquent in payment of any taxes, fees, fines, contractual debts, judgments, or any other debts due and owed to County, or is in default on any contractual or regulatory obligation to County. By submitting this solicitation response, Proposer attests that it is not delinquent in payment of any such debts due and owed to County, nor is it in default on any contractual or regulatory obligation to County. In the event the Proposer's statement is discovered to be false, Proposer will be subject to suspension and debarment and County may terminate any contract it has with Proposer.

Award of the Agreement is subject to approval as provided for in the Manatee County Procurement Code.

END SECTION C

SECTION D, FORMS

FORM 1 - ACKNOWLEDGMENT OF ADDENDA

The undersigned acknowledges receipt of the following addenda:

Addendum No. _____	Date Received:
Addendum No. _____	Date Received:
Addendum No. _____	Date Received:
Addendum No. _____	Date Received:
Addendum No. _____	Date Received:
Addendum No. _____	Date Received:
Addendum No. _____	Date Received:
Addendum No. _____	Date Received:
Addendum No. _____	Date Received:

Print or type Proposer's information below:

Name of Proposer	Telephone Number
Street Address	City/State/Zip
Email Address	Website Address
Print Name & Title of Authorized Officer	Signature of Authorized Official Date

FORM 2 - PROPOSAL SIGNATURE FORM

The undersigned represents that by signing this Proposal Signature Form that:

(1) He/she has the authority and approval of the legal entity purporting to submit the Proposal and any additional documentation which may be required such as the Joint Venture Agreement or Joint Venture Affidavit, if applicable; and

(2) All facts and responses set forth in the Proposal are true and correct; and

(3) If the Proposer is selected by County to negotiate an agreement, that Proposer's negotiators will negotiate in good faith to establish an agreement to provide the services described in this RFQ; and

(4) By submitting a Proposal and signing below, the Proposer agrees to the terms and conditions in this RFQ, which incorporates all addenda, appendices, exhibits, and attachments, in its entirety, and is prepared to sign the Agreement, of which a sample is incorporated into this RFQ as Exhibit 4. The Proposer understands that if it submits exceptions to the Sample Agreement in its Proposal, the Proposer may be determined non-responsive.

Print or type Proposer's information below:

Name of Proposer	Telephone Number
Street Address	City/State/Zip
Email Address	Web Address
Print Name & Title of Authorized Officer	Signature of Authorized Officer Date

FORM 3 - PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES CERTIFICATION

SWORN STATEMENT PURSUANT TO MANATEE COUNTY PROCUREMENT CODE SECTION 2-26 ARTICLE V,

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

This sworn statement is submitted to Manatee County by

_____

[print individual's name and title]

for _____

[name of entity submitting sworn statement]

whose business address is: _____

and (if applicable) its Federal Employer Identification Number (FEIN) is _____

_____. If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement:

I, the undersigned, understand that no person or entity shall be awarded or receive a County contract for public improvements, procurement of goods or services (including professional services) or a county lease, franchise, concession or management agreement, or shall receive a grant of County monies unless such person or entity has submitted a written certification to County that it has not:

(1) been convicted of bribery or attempting to bribe a public officer or employee of Manatee County, the State of Florida, or any other public entity, including, but not limited to the Government of the United States, any state, or any local government authority in the United States, in that officer's or employee's official capacity; or

(2) been convicted of an agreement or collusion among Proposers or prospective Proposers in restraint of freedom of competition, by agreement to bid a fixed price, or otherwise; or

(3) been convicted of a violation of an environmental law that, as determined by the County, reflects negatively upon the ability of the person or entity to conduct business in a responsible manner; or

(4) made an admission of guilt of such conduct described in items (1), (2) or (3) above, which is a matter of record, but has not been prosecuted for such conduct, or has made an admission of guilt of such conduct, which is a matter of record, pursuant to formal prosecution. An admission of guilt shall be construed to include a plea of nolo contendere; or

(5) where an officer, official, agent or employee of a business entity has been convicted of, or has admitted guilt to, any of the crimes set forth above on behalf of such and entity and pursuant to the direction or authorization of an official thereof (including the person committing the offense, if he/she is an official of the business entity), the business shall be chargeable with the conduct herein above set forth. A business entity shall be chargeable with the conduct of an affiliated entity, whether wholly owned, partially owned, or one which has common ownership or a common board of directors.

For purposes of this Form, business entities are affiliated if, directly or indirectly, one business entity controls or has the power to control another business entity, or if an individual or group of individuals controls or has the power to control both entities. Indicia of control shall include, without limitation, interlocking management or ownership, identity of interests amount family members, shared organization of a business entity following the ineligibility of a business entity under this Article, or using substantially the same management, ownership or principles as the ineligible entity.

Any person or entity who claims that this Article is inapplicable to him/her/it because a conviction or judgment has been reversed by a court of competent jurisdiction, shall prove the same with documentation satisfactory to Manatee County's Purchasing Official. Upon presentation of such satisfactory proof, the person or entity shall be allowed to contract with Manatee County.

I UNDERSTAND THAT ANY CONTRACT OR BUSINESS TRANSACTION SHALL PROVIDE FOR SUSPENSION OF PAYMENTS, OR TERMINATION, OR BOTH, IF THE PROCUREMENT DIVISION OR THE COUNTY ADMINISTRATOR DETERMINES THAT **SUCH PERSON OR ENTITY HAS MADE FALSE CERTIFICATION.**

_____

Signature of Contractor Representative

STATE OF _____

COUNTY OF_____

Sworn to and subscribed before me this _____ day of _____, 20___

by _____. ☐ Personally known OR ☐ Produced the following identification

_____

[Type of identification]

_____

Notary Public Signature

My commission expires_____

_____

[Print, type or stamp Commissioned name of Notary Public]

Signatory Requirement - In the case of a business entity other than a partnership or a corporation, this affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, this affidavit shall be executed by the general partner(s). In the case of a corporation, this affidavit shall be executed by the corporate president.

FORM 4 - CONFLICT OF INTEREST DISCLOSURE FORM

The award of an agreement resulting from this RFQ is subject to the provisions of Manatee County Code of Laws. Proposer must disclose within its Proposal: the name of any officer, director, or agent who is also an employee of Manatee County. Furthermore, Proposer must disclose the name of any County employee who owns, directly or indirectly, an interest of more than five percent (5%) in the Proposer's firm or any of its branches, divisions, or affiliates.

By signing below, Proposer confirms that it is not currently engaged or will not become engaged in any obligations, undertakings or contracts that will require the firm to maintain an adversarial role against the County or that will impair or influence the advice or recommendations it provides to the County.

Please check one of the following statements and attach additional documentation if necessary:

_____ To the best of my knowledge, the undersigned firm has no potential conflict of interest for this RFQ.

_____ The undersigned firm, by execution of this form, submits information which may be a potential conflict of interest for this RFQ.

Acknowledged and attested to by:

_____

Firm Name

_____

Signature

_____

Name and Title (Print or Type)

_____

Date

Return this fully executed form with your Proposal.

FORM 5 - NON-COLLUSION AFFIDAVIT

STATE OF _____

COUNTY OF _____

Before me, the undersigned authority, personally appeared _____, who, after being by me first duly sworn, deposes and says of his/her personal knowledge that:

a. He/She is _____ of _____, the Proposer that has submitted a Proposal to perform work for the following:

RFQ No.: _____ Title: _____

b. He/She is fully informed respecting the preparation and contents of the attached Request for Qualifications, and of all pertinent circumstances respecting such Solicitation.

Such Proposal is genuine and is not a collusive or sham Proposal.

c. Neither the said Proposer nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Proposer, firm, or person to submit a collusive or sham Proposal in connection with the Solicitation and contract for which the attached Proposal has been submitted or to refrain from proposing in connection with such Solicitation and contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Proposer, firm, or person to fix the price or prices in the attached Proposal or any other Proposer, or to fix any overhead, profit, or cost element of the Proposal price or the Proposal price of any other Proposer, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against the City or any person interested in the proposed contract.

d. The price or prices to be submitted shall be fair and proper and shall not be tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Proposer or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Signature: _____

Subscribed and sworn to (or affirmed) before me this _____ day of _____ 20__, by _____, who is personally known to me OR has produced _____ as identification.

Notary Signature_____
Notary Name: _____
Notary Public (State): _____

My Commission No: _____
Expires on: _____
SEAL

FORM 6 - TRUTH – IN – NEGOTIATION CERTIFICATE

The undersigned warrants (i) that it has not employed or retained any company or person, other than bona fide employees working solely for the undersigned, to solicit or secure the Agreement and (ii) that it has not paid or agreed to pay any person, company, corporation, individual, or firm other than its bona fide employees working solely for the undersigned or agreed to pay any fee, commission, percentage, gift, or any other consideration contingent upon or resulting from the award or making of the Agreement.

The undersigned certifies that the wage rates and other factual unit costs used to determine the compensation provided for in the Agreement are accurate, complete, and current as of the date of the Agreement.

(This document must be executed by an authorized official of Proposer (e.g., President, CEO, Partner, Managing Partner)

Name: _____

Title:_____

Date:_____

Signature:_____

FORM 7 – SCRUTINIZED COMPANY CERTIFICATION

This certification is required pursuant to Florida State Statute Section 287.135 and must be executed and returned with Proposer's Proposal.

As of July 1, 2011, a company that, at the time of bidding or submitting a Proposal for a new contract or renewal of an existing contract, is on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List is ineligible for, and may not bid on, submit a Proposal for, or enter into or renew a contract with an agency or local governmental entity for goods or services of $1 million or more.

Companies must complete and return this form with its response.

Company: _____

FEIN: _____

Address. _____

City/State/Zip. _____

I, _____, as a representative of _____ _____ certify and affirm that this entity is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List.

_____	_____
Signature	Title
_____	_____
Printed Name	Date

FORM 8, INSURANCE REQUIREMENTS

The Successful Proposer will not commence work under the resulting Agreement until all insurance coverages indicated by an "X" herein have been obtained. The Successful Proposer shall obtain and submit to the Procurement Division within ten (10) calendar days from the date of notice of intent to award, at its expense, the following minimum amounts of insurance (inclusive of any amounts provided by an umbrella or excess policy): Work under this Agreement cannot commence until all insurance coverages indicated herein have been obtained on a standard ACORD form (inclusive of any amounts provided by an umbrella or excess policy):

☒ **Automobile Liability Insurance Required Limits**
Coverage must be afforded under a per occurrence policy form including coverage for all owned, hired and non-owned vehicles for bodily injury and property damage of not less than:

- $1,000,000 Combined Single Limit; OR
- $1,000,000 Bodily Injury and $1,000,000 Property Damage
- $10,000 Personal Injury Protection (No Fault)
- $500,000 Hired, Non-Owned Liability
- $10,000 Medical Payments

This policy shall contain severability of interests' provisions.

☒ **Commercial General Liability Insurance Required Limits (per Occurrence form only; claims-made form is not acceptable)**
Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name 'Manatee County, a political subdivision of the State of Florida' as an Additional Insured, and include limits not less than:

- $2,000,000 Single Limit Per Occurrence
- $4,000,000 Aggregate
- $4,000,000 Products/Completed Operations Aggregate
- $1,000,000 Personal and Advertising Injury Liability
- $100,000 Fire Damage Liability
- $10,000 Medical Expense, and
- $1,000,000, Third Party Property Damage
- $ Project Specific Aggregate (Required on projects valued at over $10,000,000)

This policy shall contain severability of interests' provisions.

☒ **Employer's Liability Insurance**
Coverage limits of not less than:

- $100,000 Each Accident
- $500,000 Disease Each Employee
- $500,000 Disease Policy Limit

☒ Worker's Compensation Insurance
☐ **US Longshoremen & Harbor Workers Act**
☐ **Jones Act Coverage**

Coverage limits of not less than:

- Statutory workers' compensation coverage shall apply for all employees in compliance with the laws and statutes of the State of Florida and the federal government.
- If any operations are to be undertaken on or about navigable waters, coverage must be included for the US Longshoremen & Harbor Workers Act and Jones Act.

Should 'leased employees' be retained for any part of the project or service, the employee leasing agency shall provide evidence of Workers' Compensation coverage and Employer's Liability coverage for all personnel on the worksite and in compliance with the above Workers' Compensation requirements. NOTE: Workers' Compensation coverage is a firm requirement. Elective exemptions are considered on a case-by-case basis and are approved in a very limited number of instances.

☐ **Aircraft Liability Insurance Required Limits**
Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name 'Manatee County a political subdivision of the State of Florida' as an Additional Insured, and include limits not less than:

- $ Each Occurrence Property and Bodily Injury with no less than $100,000 per passenger each occurrence or a 'smooth' limit.
- $ General Aggregate.

☐ **Un-Manned Aircraft Liability Insurance (Drone)**
Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name 'Manatee County a political subdivision of the State of Florida' as an Additional Insured, and include limits not less than:

- $ Each Occurrence Property and Bodily Injury; Coverage shall specifically include operation of Unmanned Aircraft Systems (UAS), including liability and property damage.
- $ General Aggregate

☐ **Installation Floater Insurance**
When the contract or agreement **does not** include construction of, or additions to, above ground building or structures, but does involve the installation of machinery or equipment, Installation Floater Insurance shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- 100% of the completed value of such addition(s), building(s), or structure(s)

☒ **Professional Liability and/or Errors and Omissions (E&O) Liability Insurances**
Coverage shall be afforded under either an occurrence policy form or a claims-made policy form. If the coverage form is on a claims-made basis, then coverage must be maintained for a minimum of three years from termination of date of the contract. Limits must not be less than:

- $ 3,000,000 Bodily Injury and Property Damage Each Occurrence
- $ 3,000,000 General Aggregate

☐ **Builder's Risk Insurance**
When the contract or agreement includes the construction of roadways and/or the addition of a permanent structure or building, including the installation of machinery and/or equipment, Builder's Risk Insurance shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- An amount equal to 100% of the completed value of the project, or the value of the equipment to be installed
- The policy shall not carry a self-insured retention/deductible greater than $10,000

Coverage shall be for all risks and include, but not be limited to, storage and transport of materials, equipment, supplies of any kind whatsoever to be used on or incidental to the project, theft coverage, and Waiver of Occupancy Clause Endorsement, where applicable.

☐ **Cyber Liability Insurance**
Coverage shall comply with Florida Statute 501.171, shall be afforded under a per occurrence policy form, policy shall be endorsed and name 'Manatee County, a political subdivision of the State of Florida' as an Additional Insured, and include limits not less than:

- $ Security Breach Liability
- $ Security Breach Expense Each Occurrence
- $ Security Breach Expense Aggregate
- $ Replacement or Restoration of Electronic Data
- $ Extortion Threats
- $ Business Income and Extra Expense
- $ Public Relations Expense

NOTE: Policy must not carry a self-insured retention/deductible greater than $25,000.

☐ **Hazardous Materials Insurance (As Noted Below)**
Hazardous materials include all materials and substances that are currently designated or defined as hazardous by the law or rules of regulation by the State of Florida or federal government. All coverage shall be afforded under either an occurrence policy form or a claims-made policy form, and the policy shall be endorsed and name 'Manatee County, a political subdivision of the State of Florida' as an Additional Insured. If the coverage form is on a claims-made basis, then coverage must be maintained for a minimum of three years from termination of date of the contract. Limits must not be less than:

☐ ***Pollution Liability***
Amount equal to the value of the contract, subject to a $1,000,000 minimum, for Bodily Injury and Property Damage to include sudden and gradual release, each claim and aggregate.

☐ ***Asbestos Liability (If handling within scope of Contract)***
Amount equal to the value of the contract, subject to a $1,000,000 minimum, for Bodily Injury and Property Damage to include sudden and gradual release, each claim and aggregate.

☐ ***Disposal***
When applicable, Successful Proposer shall designate the disposal site and furnish a Certificate of Insurance from the disposal facility for Environmental Impairment Liability Insurance covering liability.

- Amount equal to the value of the contract, subject to a $1,000,000 minimum, for Liability for Sudden and Accidental Occurrences, each claim and an aggregate.
- Amount equal to the value of the contract, subject to a $1,000,000 minimum, for Liability for Non-Sudden and Accidental Occurrences, each claim and an aggregate.

☐ **Hazardous Waste Transportation Insurance**
Successful Proposer shall designate the hauler and have the hauler furnish a Certificate of Insurance for Automobile Liability insurance with Endorsement MCS-90 for liability arising out of the transportation of hazardous materials. EPA identification number shall be provided.

All coverage shall be afforded under either an occurrence policy form or a claims-made policy form and the policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured. If the coverage form is on a claims-made basis, then coverage must be maintained for a minimum of three years from termination of date of the contract. Limits must not be less than:

- Amount equal to the value of the contract, subject to a $1,000,000 minimum, per accident.

☐ **Liquor Liability Insurance**
Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- $1,000,000 Each Occurrence and Aggregate

☐ **Garage Keeper's Liability Insurance**
Coverage shall be required if the maintenance, servicing, cleaning or repairing of any County motor vehicles is inherent or implied within the provision of the contract.

Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- Property and asset coverage in the full replacement value of the lot or garage.

☐ **Bailee's Customer Liability Insurance**
Coverage shall be required for damage and/or destruction when County property is temporarily under the care or custody of a person or organization, including property that is on, or in transit to and from the person or organization's premises. Perils covered should include fire, lightning, theft, burglary, robbery, explosion, collision, flood, earthquake and damage or destruction during transportation by a carrier.

Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- Property and asset coverage in the full replacement value of the County asset(s) in the Successful Proposer'S care, custody and control.

☐ **Hull and Watercraft Liability Insurance**
Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- $ Each Occurrence
- $ General Aggregate
- $ Fire Damage Liability
- $10,000 Medical Expense, and
- $ Third Party Property Damage
- $ Project Specific Aggregate (Required on projects valued at over $10,000,000)

☐ **Other [Specify]**

BOND REQUIREMENTS
☐ **Bid Bond**
A Bid Bond in the amount of 5% of the total offer. Bid bond shall be submitted with the sealed response and shall include project name, location, and / or address and project number. In lieu of the bond, the bidder may file an alternative form of security in the amount of 5% of the total offer. in the form of a money order, a certified check, a cashier's check, or an irrevocable letter of credit issued to Manatee County. NOTE: A construction project over $200,000 requires a Bid Bond in the amount of 5% of the total bid offer.

☐ **Payment and Performance Bond**

A Payment and Performance Bond shall be submitted by Successful Bidder for 100% of the award amount and shall be presented to Manatee County within ten (10) calendar days of issuance of the notice of intent to award. NOTE: A construction project over $200,000 requires a Payment and Performance Bond.

INSURANCE REQUIREMENTS

I. THE POLICIES ARE TO CONTAIN, OR BE ENDORSED TO CONTAIN, THE FOLLOWING PROVISIONS:

Commercial General Liability and Automobile Liability Coverages

a. **"Manatee County, a Political Subdivision of the State of Florida," is to be named as an Additional Insured in respect to:** Liability arising out of activities performed by or on behalf of the Successful Proposer, his agents, representatives, and employees; products and completed operations of the Successful Proposer; or automobiles owned, leased, hired or borrowed by the Successful Proposer. The coverage shall contain no special limitation(s) on the scope of protection afforded to the COUNTY, its officials, employees or volunteers.
In addition to furnishing a Certificate of Insurance, the Successful Proposer shall provide the endorsement that evidences Manatee COUNTY being listed as an Additional Insured. This can be done in one of two ways: (1) an endorsement can be issued that specifically lists "Manatee County, a Political Subdivision of the State of Florida," as Additional Insured; or, (2) an endorsement can be issued that states that all Certificate Holders are Additional Insured with respect to the policy.

b. The Successful Proposer'S insurance coverage shall be primary insurance with respect to the COUNTY, its officials, employees and volunteers. Any insurance or self-insurance maintained by the COUNTY, its officials, employees or volunteers shall be excess of Successful Proposer's insurance and shall be non-contributory.

c. The insurance policies must be on an occurrence form.

Workers' Compensation and Employers' Liability Coverages

The insurer shall agree to waive all rights of subrogation against the COUNTY, its officials, employees and volunteers for losses arising from work performed by the Successful Proposer for the COUNTY.

II. General Insurance Provisions Applicable to All Policies

1. Prior to the execution of contract, or issuance of a Purchase Order, and then annually upon the anniversary date(s) of the insurance policy's renewal date(s) for as long as this contract remains in effect, Successful Proposer shall furnish the COUNTY with a Certificate(s) of Insurance (using an industry accepted certificate form, signed by the Issuer, with applicable endorsements, and containing the solicitation or contract number, and title or description) evidencing the coverage set forth above and naming "Manatee County, a Political Subdivision of the State of Florida" as an Additional Insured on the applicable coverage(s) set forth above.

2. If the policy contains an aggregate limit, confirmation is needed in writing (letter, email, etc.) that the aggregate limit has not been eroded to procurement representative when supplying Certificate of Insurance. In addition, when requested in writing from the COUNTY, Successful Proposer will provide the COUNTY with a certified copy of all applicable policies. The address where such certificates and certified policies shall be sent or delivered is as follows:

   Manatee County, a Political Subdivision of the State of Florida
   Attn: Risk Management Division
   1112 Manatee Avenue West, Suite 969
   Bradenton, FL 34205

3. The project's solicitation number and title shall be listed on each certificate.
4. Successful Proposer shall provide thirty (30) days written notice to the Risk Manager of any cancellation, non-renewal, termination, material change, or reduction in coverage of any insurance policies to procurement representative including solicitation number and title with all notices.
5. Successful Proposer agrees that should at any time Successful Proposer fail to meet or maintain the required insurance coverage(s) as set forth herein, the COUNTY may terminate this contract.
6. The Successful Proposer waives all subrogation rights against COUNTY, a Political Subdivision of the State of Florida, for all losses or damages which occur during the contract and for any events occurring during the contract period, whether the suit is brought during the contract period or not.
7. The Successful Proposer has sole responsibility for all insurance premiums and policy deductibles.
8. It is the Successful Proposer'S responsibility to ensure that his agents, representatives and subcontractors comply with the insurance requirements set forth herein. Successful Proposer shall include his agents, representatives, and subcontractors working on the project or at the worksite as insured under its policies, or Successful Proposer shall furnish separate certificates and endorsements for each agent, representative, and subcontractor working on the project or at the worksite. All coverages for agents, representatives, and subcontractors shall be subject to all of the requirements set forth to the procurement representative.
9. All required insurance policies must be written with a carrier having a minimum A.M. Best rating of A- FSC VII or better. In addition, the COUNTY has the right to review the Successful Proposer's deductible or self-insured retention and to require that it be reduced or eliminated.
10. Successful Proposer understands and agrees that the stipulated limits of coverage listed herein in this insurance section shall not be construed as a limitation of any potential liability to the COUNTY, or to others, and the COUNTY'S failure to request evidence of this insurance coverage shall not be construed as a waiver of Successful Proposer'S obligation to provide and maintain the insurance coverage specified.
11. Successful Proposer understands and agrees that the COUNTY does not waive its immunity and nothing herein shall be interpreted as a waiver of the COUNTY'S

rights, including the limitation of waiver of immunity, as set forth in Florida Statutes 768.28, or any other statutes, and the COUNTY expressly reserves these rights to the full extent allowed by law.

12. No award shall be made until the Procurement Division has received the Certificate of Insurance in accordance with this section.

BONDING REQUIREMENTS

Bid Bond/Certified Check. By submitting a proposal, the Successful Proposer agrees should its proposal be accepted, **to execute the form of Agreement and present the same to COUNTY for approval within ten (10) calendar days after notice of intent to award**. The Successful Proposer further agrees that failure to execute and deliver said form of Agreement **within ten (10) calendar days** will result in damages to COUNTY and as guarantee of payment of same a bid bond/certified check shall be enclosed within the submitted sealed proposal in the amount of five (5%) percent of the total amount of the proposal. The Successful Proposer further agrees that in case the Successful Proposer fails to enter into an Agreement, as prescribed by COUNTY, the bid bond/certified check accompanying the proposal shall be forfeited to COUNTY as agreed liquidated damages. If COUNTY enters into an agreement with a Successful Proposer, or if COUNTY rejects any and/or all proposals, accompanying bond will be promptly returned.

Payment and Performance Bonds. Prior to commencing work, the Successful Proposer shall obtain, for the benefit of and directed to COUNTY, a Payment and Performance Bond satisfying the requirements of Florida Statutes § 255.05, covering the faithful performance by the Successful Proposer of its obligation under the Contract Documents, including but not limited to the construction of the project on the project site and the payment and obligations arising thereunder, including all payments to Subcontractors, laborers, and materialmen. The surety selected by the Successful Proposer to provide the Payment and Performance Bond shall be approved by COUNTY prior to issuance of such Bond, which approval shall not be unreasonably withheld or delayed provided that surety is rated A- or better by Best's Key Guide, latest edition.

Failure to provide the required bonds on the prescribed form may result in Successful Proposer being deemed nonresponsive. Bonds must be in the form prescribed in Florida Statutes § 255.05, and must not contain notice, demand or other terms and conditions, including informal pre-claim meetings, not provided for in Florida Statutes § 255.05.

Bonds shall be in an amount equal to 100% of the contract price issued by a duly authorized and nationally recognized surety company, authorized to do business in the State of Florida, satisfactory to COUNTY. Surety shall be rated as "A-" or better by Best's Key Guide, latest edition. The attorney-in-fact who signs the bonds must file with the bonds, a certificate and effective dated copy of power-of-attorney. Payment and Performance Bonds shall be issued to "Manatee County, a political subdivision of the State of Florida", **within ten (10) calendar days after issuance of notice of intent to award**.

In addition, pursuant to Florida Statutes § 255.05(1)(b), Florida Statutes, prior to commencing work, the Successful Proposer shall be responsible and bear all costs associated to record the Payment and Performance Bond with the Manatee County Clerk of the Circuit Court. A certified copy of said recording shall be furnished to the Procurement Division upon filing. Pursuant to Florida Statutes § 255.05(1)(b), Florida Statutes, COUNTY will make no payment to the Successful Proposer until the Successful Proposer has complied with this paragraph.

Furnishing Payment and Performance Bonds shall be requisite to execution of an Agreement with COUNTY. Said Payment and Performance Bonds will remain in force for the duration of this Agreement with the premiums paid by the Successful Proposer. Failure of the Successful Proposer to execute such Agreement and to supply the required bonds shall be just cause for cancellation of the award. COUNTY may then contract with the next lowest, responsive and responsible Successful Proposer or re-advertise this RFP.

Failure of COUNTY at any time to require performance by the Successful Proposer of any provisions set out in the resulting Agreement will in no way affect the right of COUNTY, thereafter, to enforce those provisions.

FORM 8, INSURANCE STATEMENT
RFQ NO. 24-TA005084SAM

THE UNDERSIGNED has read and understands the insurance requirements applicable to any Agreement resulting from this solicitation and shall provide the insurances required in this RFQ within ten (10) days from the date of Notice of Intent to Award.

Proposer Name: _____ Date: _____

Signature (Authorized Official): _____

Printed Name/Title: _____

Insurance Agency: _____

Agent Name: _____ Agent Phone: _____

Return this signed statement with your proposal.

FORM 9, INDEMNITY AND HOLD HARMLESS

MANATEE COUNTY, A POLITICAL SUBDIVISION OF THE STATE OF FLORIDA

The Successful Proposer shall indemnify and hold harmless County, its officers, and employees from liabilities, damages, losses, and costs, including but not limited to reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentionally wrongful conduct of the Successful Proposer, its personnel, design professionals and other persons employed or utilized by the Successful Proposer in the performance of the Agreement, including without limitation, defects in design, or errors or omissions that result in material cost increases to County. Such indemnification shall include the payment of all valid claims, losses, and judgments of any nature whatsoever in connection therewith and the payment of all related fees and costs. County reserves the right to defend itself with its own counsel or retained counsel at Successful Proposer's expense.

Signature of Authorized Official of Proposer: _____

Title: Date: _____

Project Number and /or Name:_____

Insurance Agent: _____

Acknowledgement:

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me this _____ day of _____, 20____ by _____ [FULL LEGAL NAME], who is

☐ Personally known to me
OR
☐ has produced _____ as identification.

Notary Signature _____
Print Name _____
Seal

SECTION E, EXHIBITS

Exhibit 1, Scope of Services
Exhibit 2, Proposal Response
Exhibit 3, Southeast Regional Water Reclamation Facility: Electrical Master Plan
Exhibit 4, Sample Agreement

EXHIBIT 1, SCOPE OF SERVICES
RFQ NO. 24-TA005084SAM

1.01 BACKGROUND INFORMATION

Manatee County, a political subdivision of the State of Florida (hereinafter in this Scope referred to as County), is seeking proposals from qualified firms for the provision of Professional Engineering Services and other professional services for the Southeast Water Reclamation Facility (SEWRF) Capacity Switchgear Replacement Project located at 3331 Lena Road, Bradenton, FL 34211.

1.02 PROJECT DESCRIPTION

Replacement of the Ml and possibly M2 480V Electrical Switchgears at the SEWRF. The new switchgear will incorporate the feeder breakers into the M3 and M4 switchgear lineups and include all appurtenances for successful installation. Occupational Safety and Health Administration Arc flash safety requirements must be included in the design.

1.03 SCOPE

The successful Proposer (hereinafter in this scope referred to as Consultant) shall furnish all equipment, labor, materials, supplies, licensing, transportation and other components necessary to perform Professional Engineering Services and other professional services for the Project to include, but not limited to the following disciplines and sub-disciplines:

- Data Collection, Basis of Design, and Preliminary design
- Wastewater Treatment - Process Engineering/ Modeling
- Design Phase Services - Engineering (Civil, Structural, Mechanical, Electrical, Instrumentation and Controls)
- Permitting Phase Services
- Construction Phase Services

1.04 SERVICE REQUIREMENTS

The Consultant's services shall include, but not limited to, the following:

1. Engineering Design and Specification (Electrical Engineering & Wastewater Plant modeling)
2. Permitting (Meetings, Applications and Certifications)
3. Utility Coordination
4. Coordination with other firms with concurrent projects at the SEWRF.
    a. Design must take into account concurrent projects either in design or construction.
5. Perform Field Reviews

6. Attend Project Meetings, Prepare Meeting Agendas and Meeting Minutes
7. Attend Design Review Meetings
8. Project Scheduling
9. Construction Phasing
10. Engineering Contract Administration and Management
11. Contract File (Setup and Maintenance)
12. Bidding and Construction Phase Services
13. Assist in the preparation Record Drawings
14. All Other Services Necessary for Project Completion

1.05 DELIVERABLES

The Consultant shall provide the following deliverables to the County:

1. Project Management, Coordination, Field Review, Data Collection
    a. Project Schedule
    b. Final CAD base files in "DWG" format
    c. Records of correspondence with permitting agencies and utilities
    d. Provide monthly progress reports for the duration of the project.
    e. Attend monthly project meetings and provide meeting minutes to the County.
    f. Collect Data and As-Builts as necessary of the project design.
    g. Conduct a field review of the project to take photos, note field conditions, and verify information within the project limits.

2. Design and Permitting
    a. Preliminary Design (30%)
        i. One (1) electronic set of plans in "pdf' format.
        ii. One (1) electronic copy of the 30% opinion of probable construction cost with bid quantities in "pdf' format.
        iii. All electronic copies of the items listed above are to be submitted via the Design Review (DESR) process in e-Builder.
    b. Intermediate Design (60%)
        i. One (1) electronic set of plans in "pdf' format.
        ii. One (1) electronic set of technical specifications in "pdf' format.
        iii. One (1) electronic copy of the updated opinion of probable construction cost with bid quantities in "pdf' format.
        iv. All electronic copies of the items listed above are to be submitted via the Design Review (DESR) process in e-Builder.
    c. Intermediate Design (90%)
        i. One (1) electronic set of plans in "pdf' format.
        ii. One (1) electronic set of technical specifications in "pdf' format.

iii. One (1) electronic copy of the updated opinion of probable construction cost with bid quantities in "pdf' format.
iv. All electronic copies of the items listed above are to be submitted via the Design Review (DESR) process in e-Builder.

d. Final Design (100%)
i. One (1) set of Signed and Sealed 24"x36" plans and Technical Specifications
ii. One (1) electronic set of digitally signed and sealed plans, Technical Specifications and Special Provisions in "pdf' format.
iii. One (1) copy of all base files in AutoCAD "dwg" format and text fonts used.
iv. One (1) final opinion of probable construction cost with bid quantities in "pdf' format.
v. One (1) copy of all permits in "pdf' format.
vi. All electronic copies of the items listed above are to be submitted via the Design Review (DESR) process in e-Builder.

e. Permitting: submit permit applications for the construction of the project to the authority having jurisdiction.

3. Construction Phase Services
a. Construction Phase
i. Attend one (1) pre-construction meeting, prepare and provide agenda and minutes of the meeting.
ii. Attend monthly progress meetings during the construction phase.
iii. Notify permitting agencies of the start of construction, as necessary and in accordance with permit conditions.
iv. Review monthly pay applications submitted by the Contractor for completeness and make recommendations for payments.
v. Review and provide responses/approvals for submittals, RFls, and shop drawings.
vi. Provide recommendations of changes, as necessary, which may be required within the scope of the project during construction.
vii. Conduct a limited number of site visits during construction to observe general construction activities and prepare a one-page narrative on the progress of the work.
viii. Prepare the punch list items to be corrected or completed at the substantial and final completion stages of the work.
ix. Assist in the preparation and verify correctness Record Drawings
1. Provide one copy of the Record Drawings Signed and Sealed by the Engineer-of-Record.

1.06 GENERAL DUTIES OF THE CONSULTANT

The relationship of the Consultant to the County will be that of a professional consultant, and the Consultant will provide the professional and technical services required under the resulting Agreement in accordance with professional practices and ethical standards. No employer/employee relationships shall be deemed to be established and the consultant, its agents, subcontractors, and employees shall be independent contractors at all times.

It shall be the responsibility of the Consultant to work with the County and apprise it of solutions to problems and the approach or technique to be used towards accomplishment of the County objectives as set forth in this RFQ, which will be made a part of the Agreement upon execution by both parties.

The Consultant shall be responsible for the professional quality, technical accuracy, timely completion, compliance with laws, regulations and rules, and the coordination with all appropriate agencies of all designs, drawings, specifications, reports and other Professional Services provided by the Consultant. If the County, in its sole discretion, determines there are errors, omissions or other deficiencies in the Consultant's designs, drawings, specifications, reports and other services, the Consultant shall, without additional compensation, correct or revise said errors or omissions to the satisfaction of the County.

The Consultant shall be familiar with Manatee County Standards, templates and processes.

The Consultant shall be required to use the Internet web-based project management tool, e-Builder Enterprise™ (e-Builder), and protocols included in that software during this project; and shall take any training courses required by the Owner, at no additional cost to the Owner. The use of this project management system does not replace or change any contractual responsibilities of the participants.

User registration, electronic and computer equipment, and Internet connections required for e- Builder are the responsibility of the Consultant. The sharing of user accounts is prohibited. Individuals who are granted log-in access to the County e-Builder platform shall be responsible for the proper use of their passwords and access to data as agents of the Consultant. For documents requiring original signature such as Contracts, Change Orders, Application and Certification for Payment, and Field Directives, paper documents may be required in addition to submittal via e-Builder.

User licenses for e-Builder Enterprise™ will be provided and paid for by the Owner based on assigned roles for the project including Project Manager, Project Fiscal, Project Superintendent, and others as may be required.

1.07 ESTIMATED PROJECT COMPLETION DATE

The estimated project completion time for the 100% design submittal for this RFQ is 15 months from the project design kick-off meeting.

1.08 ESTIMATED PROJECT COST

The County has estimated the project design and construction cost at approximately $5,891,000.

END OF EXHIBIT 1

EXHIBIT 2, PROPOSAL RESPONSE

This section identifies specific information which must be contained within the Proposal response and the order in which such information should be organized. The information each Proposer provides will be used to determine those Proposers with the background, experience and capacity to perform the scope of services as stated in this RFQ and which Proposer(s) best meets the overall needs of the County. For more information on the evaluation process, refer to Section B, Evaluation of Responses.

2.01 INFORMATION TO BE SUBMITTED

The contents of each Response will be organized and arranged with tabs in the same order as listed below and with the same TAB name & numbers. The Response should contain sufficient detail to permit the County to conduct a meaningful evaluation. However, overly elaborate responses are not requested or desired. NOTE: Tabs 6, 7, 8 & 9 are limited to 30 Single-Sided pages.

2.02 RESPONSE FORMAT

TAB 1 - INTRODUCTION

Include the following in Tab 1 of the Response.

1. A cover page that identifies Proposer, the RFQ by title and the RFQ number.

2. An introductory letter/statement that describe your Response in summary form.

3. A table of contents.

TAB 2 – MINIMUM QUALIFICATION REQUIREMENTS

In Tab 2 submit the information and documentation requested that confirms Proposers meets the following minimum qualification requirement(s):

1. Must be registered with the State of Florida, Division of Corporations to do business in Florida.

   No documentation is required. The County will verify registration.

2. Proposer and/or its subconsultant(s) must possess current, valid licenses and certifications required under Florida Statute to perform professional engineering services.

   Submit information and documentation from the issuing agency that confirms Proposer and/or its subconsultant(s) meet the following:

   a. Certified under Section 471.023, Florida Statutes, to practice or to offer to practice engineering; or

b. Certified under Section 481.219, Florida Statutes, to practice or to offer to practice architecture.

3. Proposer or its subconsultant has completed (which means that certificate of occupancy has been issued) a minimum of two (2) projects in a Water Reclamation Facility since December 1, 2018. Provide the following information for each qualifying project. Project contacts shall be currently associated with the organization and be willing to respond to an email inquiry by the County.

   a. Identify who was contracted to complete the project (Proposer or subconsultant)
   b. Project name and location
   c. Client/Organization name
   d. Contact name
   e. Contact phone
   f. Contact email
   g. Project dates (Start/End)

4. Proposer Is NOT listed on the Florida State Board of Administration, Scrutinized List of Prohibited Companies.

   No documentation is required. The County will verify.

5. Proposer is not on the Florida Suspended or Debarred Vendor List

   No documentation is required. The County will verify.

6. Proposer is not on the Federal Convicted Vendor or Excluded Parties list (SAM/EPLS)

   No documentation is required. The County will verify.

7. If Proposer is submitting as a joint venture, it must have file the required documents with the Florida Department of Business and Professional Regulation as required by Florida Statute Section 489.119, prior to the Due Date and Time.

   If Proposer is a joint venture, provide a copy of Proposer's approved filing with the Florida Department of Business and Professional Regulation.

8. Proposer has no reported conflict of interests in relation to this RFQ.

   If no conflicts of interests are present, Bidder must submit a fully completed copy of Form 4.

   If there is a potential conflict of interest, on a separate page submit a statement to that affect and disclose the name of any officer, director or agent who is an

employee of the County. Disclose the name of any County employee who owns, directly or indirectly, any interest in Bidder's firm or any of its branches.

TAB 3 – FORMS

Provide the completed and executed Forms listed below in Tab 3.

Form 1, Acknowledgement of Addenda
Form 2, Response Signature Form
Form 3, Public Contracting and Environmental Crimes Certification
Form 4, Conflict of Interest Disclosure
Form 5, Non-Collusion Affidavit
Form 6, Truth in Negotiation Certification
Form 7, Scrutinized Company Certification
Form 8, Insurance Statement
Form 9, Indemnity and Hold Harmless

TAB 4 - TRADE SECRETS

Pursuant to Section A.28, Trade Secrets, in Tab 4 identify any trade secret being claimed. Proposer must submit purported trade secret as follows:

1. Trade secret material must be segregated, within the applicable TAB, from the portions of the Response that are not being declared as trade secret. NOTE: Responses cannot be designated as 'Proprietary' or 'Confidential' in their entirety.

2. Proposer shall cite, for each trade secret being claimed, the Florida Statute number which supports the designation.

3. Proposer shall offer a brief written explanation as to why information claimed as trade secret fits the cited Statute.

4. Proposer shall provide an additional electronic copy of its Response that redacts all designated trade secrets.

TAB 5 - PROPOSER STATEMENT OF ORGANIZATION

In Tab 5, provide information and documentation on Proposer as follows:

1. Legal contracting name including any dba.
2. State of organization or incorporation.
3. Ownership structure of Proposer's company.
   (e.g., Sole Proprietorship, Partnership, Limited Liability Corporation, Corporation)
4. Federal Identification Number.
5. A fully completed (signed and dated) copy of Proposer's W-9.
6. Contact information for Proposer's corporate headquarters and local office (if different) NOTE: local is defined as Manatee, DeSoto, Hardee, Hillsborough, Pinellas or Sarasota counties.
   a. Address
   b. County, State, Zip
   c. Phone
   d. Number of years at this location
7. List of officers, owners and/or partners, or managers of the firm. Include names, addresses, email addresses, and phone numbers.
8. Provide supporting documentation from the certifying agent indicating Proposer is a certified Minority-owned Business Enterprise, if applicable.
9. Contact information for Proposer's primary and secondary representatives during this RFQ process to include the following information:
   a. Name
   b. Phone
   c. E-mail
   d. Mailing Address
   e. County, State, Zip
10. Provide a brief summary regarding any prior or pending litigation, either civil or criminal, involving a governmental agency or which may affect the performance of the services to be rendered herein, in which the Proposer, any of its partners, employees or subconsultants is or has been involved within the last three (3) years.
11. Provide details of any ownership changes to Proposer's organization in the past three (3) years or changes anticipated within six (6) months of the Due Date and Time (e.g., mergers, acquisitions, changes in executive leadership).

TAB 6 – RESPONDENT AND TEAM'S EXPERIENCE (MAXIMUM POINTS 25)

In Tab 6, provide details of Proposer and its team's experience to include the following:

1. Provide a summary of Proposer's background, size and years in business.
2. Describe Proposer's experience in professional engineering services for other government agencies, particularly those within Florida.
3. Provide Proposer's years of experience in professional electrical engineering in a water reclamation facility.
4. Identify and include information regarding experience and qualifications of Proposer's key staff to be assigned to the services. Include a resume for each with the name of the firm(s) for their current and previous employers, their full names, professional credentials (e.g., certifications and/or licenses), and roles and duties which the individuals will provide to the County, that are relevant to this project. Include the address of their current primary office location, email address and phone number.
5. Identify any proposed sub-consultants to accomplish the work. Include the company name, the name of the individual(s) to be assigned, and an overview of their experience and qualifications applicable to their role in the provision of professional electrical engineering services for the County.
6. Describe any significant or unique accomplishments, recognition, or awards received by Proposer, its key personnel, or its subconsultants for previous similar services.
7. Provide a minimum of three (3) client references for professional electrical engineering in a water reclamation facility since December 1, 2018, performed by Proposer, who are agreeable to responding to an inquiry by the County via SurveyMonkey®. References should include the following information:
    a. Client name
    b. Client address
    c. Client contact name
    d. Client contact phone and fax numbers
    e. Client contact email address
    f. Brief description of work (1-2 sentences)
    g. Performance period (start/end dates)
    h. Total dollar value of contract

(Remainder of this page intentionally left blank)

TAB 7 – APPROACH TO ENGINEERING SERVICES (MAXIMUM POINTS 30)

In Tab 7, provide Proposer's project approach to include the following:

1. A narrative of the project approach and an explanation of how this approach meets County objectives and requirements as specified in this RFQ.
2. An explanation of Proposer's technical ability to perform all facets of the scope of services defined in Exhibit 1. If more than one Proposer is jointly filing a Response, details must be provided to clearly demonstrate individual roles and responsibility for all components of the project.
3. Details of implementation plan and schedule. Provide an implementation schedule for each component of services (e.g., design, demolition, construction). NOTE: Proposer must commit to a timetable of no more than 15 months for 100% design submittal from the project design kick-off meeting.
4. Provide a narrative of the methodology for engaging with County representatives in-the-course of performing the duties.
5. Proposer shall thoroughly explain:
    a. Its accessibility in the areas of availability for meetings, general communications, coordination, and supervision
    b. How Proposer physically plans on attending pre-scheduled meetings.
    c. How Proposer plans on ensuring accessibility and availability during the term of the Agreement.
6. Proposers are encouraged to propose the use of as many environmentally preferable, sustainable, 'green' products, materials and supplies to promote a safe and healthy environment. Submit a summary of Proposer's environmental sustainability initiatives and any products, materials or supplies that are proposed for the County's work that have documented evidence of reducing adverse effects on the environment.
7. Provide a statement on company letterhead and signed by an authorized official of Proposer attesting to its commitment to meet the County's time and budget requirements for all assigned work.
8. Submit any additional information not previously requested which Proposer believes would assist County in the evaluation of Proposer's approach to provide the required services.

(Remainder of this page intentionally left blank)

TAB 8 - ORGANIZATIONAL STRUCTURE AND CAPACITY (MAXIMUM POINTS 25)

1. Submit details of Proposer's staffing resources, at the location that will provide services to the County as well as corporately; by discipline and the number of personnel within each discipline.
2. Detail the location of the managing office and what plans will be adopted to ensure County citizens receive consideration for employment; and suppliers located within the County will be used for the acquisition of goods and services needed to perform the scope of services.
3. If Proposer's staffing resources includes sub-consultants, submit the name of the firm(s) who will perform each discipline. If more than one firm is listed for a discipline, then label which firm is the primary firm for that discipline. Firms may perform more than one discipline.
4. Submit an organizational diagram clearly identifying key personnel as well as other staffing resources who are designated to provide services to the County. For each individual in the organization diagram, include each individual's name, title, firm and indicate their functional relationship to each other.
5. If Proposer is teaming with other entities to provide the required goods and services, detail any prior similar work any two or more team members have jointly performed.
6. If a joint venture is proposed, provide an affidavit attesting to the formulation of the joint venture and provide proof of incorporation as a joint venture or a copy of the formal joint venture agreement between all joint venture parties, indicating their respective roles, responsibilities, and levels of participation in the project.
7. An explanation, in general terms, of Proposers' financial capacity to perform the scope of services. If Proposer is jointly filing a Response with other entities, details must be provided to demonstrate financial capacity of each entity.
8. Provide a statement on company letterhead and signed by a company official authorizing a County auditor and/or financial analysts access to your financial records, including all records prepared by an independent firm, or the financial records of other entities for which you have ownership interest. Such access will occur at the primary location of the Proposer, or such other location as may be agreed, for the purposes of verifying financial representations, and/or to review and assess the historical and current financial capacity of Proposer's business entity and its expected ability to meet ongoing financial obligations related to the required services, if awarded a contract. If an audit is conducted, the County's audit and/or financial analysts will report their findings in a summary report to the Purchasing Official, which will be placed in the Response files for subsequent use, review, and discussions during evaluations.
9. Disclose any ownership interest in other entities proposed for services. This ownership disclosure includes ownership by the Proposer through a parent, subsidiary or holding company or any other form of business entity. Submit entity names and the percent of ownership for each.
10. Detail Proposer and any subconsultants' current workloads and any projected changes to the workload within the next six (6) months.
11. Provide a list of professional engineering projects that have been awarded to the Proposer by Manatee County in the past two (2) years since December 1, 2023.

Include the following information for each:

a. Name of the project.
b. Date of award.
c. Dollar value of the design work.

12. Submit any additional information not previously requested which Proposer believes would assist County in the evaluation of Proposer's capacity to provide the required services.

(Remainder of this page intentionally left blank)

TAB 9 - SIMILAR COMPLETED PROJECTS (MAXIMUM POINTS 20)

Provide a list a minimum of two (2) projects, particularly those in a water reclamation facility, which Proposer has provided professional electrical engineering services since December 1, 2018. Include the following information:

a. Organization/Owner name
b. Address (County/State)
c. Project date (Start/End)
d. Proposer's role in the project (e.g., prime/lead, sub)
e. Scope of work (Brief description 1-2 sentences)
f. Total project costs

NOTE: Representative photographs and exhibits supporting the above projects are permitted as an attachment to this section.

END EXHIBIT 2

MANATEE COUNTY UTILITIES

SOUTHEAST REGIONAL WATER RECLAMATION FACILITY: ELECTRICAL MASTER PLAN

FINAL
JULY 2018

401 NORTH CATTLEMEN ROAD, SUITE 306 • SARASOTA, FLORIDA 34232 • P. 941.371.9832 •

MANATEE COUNTY UTILITIES

NORTH REGIONAL WATER RECLAMATION FACILITY ELECTRICAL MASTER PLAN

TABLE OF CONTENTS

Page No.

LIST OF TABLES

1.0 EXECUTIVE SUMMARY

Manatee County (County) owns and operates the Southeast Water Reclamation Facility (SEWRF), an advanced wastewater treatment facility permitted to treat 11.0 million gallons per day (mgd) at a three month rolling average daily flow. Located in southeast Manatee County at 3525 Lena Rd in Bradenton, FL, the SEWRF was built in 1989 and serves as one of three water reclamation facilities for the County's service territory. Treating County wastewater to reuse standards, its effluent is pumped to a piped network of agricultural users.

Influent treatment and effluent distribution have the capacity to demand several megawatts of electricity, and this load is expected to increase as the Manatee County population grows. This growth and the natural deterioration of aging equipment drive the need for continuous plant maintenance and improvement, and for that purpose the County has hired Carollo Engineers, Inc. (Carollo) to develop an Electrical Master Plan that guides this development. In it, Carollo assessed the plant's condition and proposes projects to maintain reliable service and manage growth wisely.

Carollo has investigated the following aspects of the SEWRF plant and operations:

- Condition assessment of all major electrical gear, including: the physical integrity and operability of the enclosure, doors, switches, indicator lights, and overcurrent protection; the age and expected remaining life of the equipment; the availability of spare parts, the impacts of a corrosive environment; spare electrical capacity; and physical space available to accommodate growth.

- The reliability of the plant to receive, treat, and discharge influent. Electrically, this means to evaluate the architecture of the electrical system so that it accommodates the staff's needs to balance plant loads across distribution sources, minimize single points of failure, provide switching capability among distribution paths, and make alternate power sources available throughout the plant.

- The safety and functionality of the facility's electrical power system and distribution equipment in normal and abnormal conditions; whether the equipment operates within its ratings; arc flash conditions, operating procedures, and maintenance practices, the equipment's ability to isolate short-circuit faults; or whether equipment can be taken out of service for maintenance or repairs.

- The perspective of plant staff on equipment and systems that need repair or replacement, based on their experience with functionality and failures. Staff shared their concerns about equipment that poses safety hazards, operational inefficiencies,

and maintenance liabilities. The staff's working experience with the SEWRF systems is consistent with Carollo's observations, and this report incorporates their expertise and priorities.

- An analysis of the SEWRF's utility service from FP&L, including: reliability data at the plant's service entrances; billing data by month, to build a 5-year energy profile of seasonal consumption; and a study of billing rates to determine the base rate, peak (kW) rate, and energy (kW*hr) rate for each service.

Having investigated the SEWRF plant and operations, Carollo then makes the following recommendations to address existing deficiencies and potential problems that can be anticipated from the years 2018 to 2045. The recommendations are summarized as:

- Operational improvements to improve safety, reliability, and minimum overall cost of ownership:
  - Establish a stricter practice of maintaining plant documentation
  - Create a tagging system with unique identifiers that match field labeling to drawings
  - Define plant technical preferences, standards, or requirements for Electrical, Instrumentation, and Control installations (to simplify contracting and oversight of Consultants and Contractors
  - Develop an Electrical Preventive Maintenance (EPM) program that's aligned with NFPA 70B, the Recommended Practice for Electrical Equipment Maintenance.
  - Implement the Electrical Safety Plan (ESP) from 2017
  - Record power meter data annually and reset meter fields
  - Establish a procedure for taking an annual energy baseline.

- Short term improvements to maintain the functionality of existing equipment that may be in use for many years:
  - General maintenance tasks to secure basic equipment functionality.
  - Studies and maintenance to ensure power reliability.
  - Studies and maintenance to remedy power quality problems.
  - Probable cost of short term improvements.

- Capital Improvement Projects (CIPs) to maintain the SEWRF electrical system's ability to treat and deliver water. Some of these projects are driven by the natural life cycle of electrical equipment (whose materials degrade with time), some projects support work being done add/replace loads for treatment processes, and others are recommended to modify the system's architecture. The aim is to build a resilient system at minimum overall cost to both the capital and operational budgets. These are listed below, in Table 1.

1.1 Summary of Findings and Recommendations

Recommendations for upgrading the power distribution system are summarized below (in Table 1), and an accounting of each construction cost estimate is further itemized in Sections 6 and 7 (engineering is *not* included). All numbers are given in 2018 dollars; estimates of inflation have not been accounted for in the following figures.

Table 1 Summary of Electrical Improvements and Related Construction Cost

No	Description	Recommended Year	Total*
0	Short Term Improvements	2019	$159,000
1	Replacements with RAS/WAS System Rehabilitation	2019	$763,000
2	Dedicated Plant Drain Station	2019	$89,000
3	Replace SWGR-1A/B and Generator Switchboards 1/2 and 2/3	2019	$1,408,000
4	Replace MCC-5 and MCC-6 (and Arc Flash Mitigation)	2019	$683,000
5	Anoxic Basins Mixer Replacements	2020	$399,000
6	Flow Equalization Tanks and Mixed Liquor Splitter Box Rehabilitation	2021	$110,000
7	Replace BFP control Panels with Belt Filter Press Upgrades	2022	$394,000
8	Secondary Clarifiers Rehabilitation	2022	$65,000
9	New MCC and Electrical Building for Anoxic/Aeration Basin #4	2026	$776,000
10	Electrical System Upgrades	2030	$2,444,000
11	VFD Replacements for Sludge Pumps	2033	$90,000
12	MARS Equipment Replacements	2035	$1,273,000
13	Replace Generator 1 in 2035	2035	$1,833,000
14	Biosolids Equipment Replacements	2038	$585,000
15	Replace Generator 2 in 2045	2045	$1,833,000
16	Electrical Equipment Replacements	2045	$415,000
OPINION OF TOTAL PROBABLE CONSTRUCTION COST			**$13,319,000**

* Class 5 estimates, based on AACE.

Carollo's assessment of the SEWRF electrical distribution system (refer to one-line diagram EMP-2018 in Appendix B) revealed that:

- The current configuration makes the plant power system vulnerable to a loss of either FP&L transformer, because SWGR-2A/B is mostly dedicated to process loads and SWGR-1A/B to effluent loads (with some overlap). Carollo proposes rearranging this

configuration to dedicate each service transformer to one wing (load bus) of the replacement SWGR-1A/B. To clarify: when this report refers to SWGR-1A/B, it's referring to the existing switchgear, SWGR-1, which does not have a transfer bus (see the next paragraph for discussion of its replacement: SWGR-1A/T/B).

- The plant appears to be overinvested in standby power capacity, with 6000 kW (7200 kVA) of generator power available, but only 3000 kVA of utility transformer capacity. Some of that excess capacity will be required for starting your motors, but the largest motors are all run from VFDs so providing twice the generator capacity as transformers is excessive. Carollo recommends replacing the two separate generator switchgear assemblies with a single one that enables the plant to parallel its standby sources. The replacement SWGR-1A/T/B will have metering that allows staff to study the plant's loading patterns before deciding whether to replace Generators 1 and 2, both due for replacement in 2025. As an alternative, metering can be added before the replacement of SWGR-1A/T/B, and can provide valuable data to inform those projects. To clarify: when this report refers to SWGR-1A//T/B, it's referring to the new switchgear that will replace the existing SWGR-1A/B. The difference is that the new switchgear will have a transfer bus for receiving generator power from an external generator switchgear (SWGR-GEN).

- The original equipment, installed between 1988 and 1989, is reaching the end of its useful life. Numerous pieces of electrical equipment are obsolete due to changes in electrical technology and a lack of spare parts; others are in poor condition from 30 years of service. To maintain a reliable and safe power distribution system, electrical equipment more than 25 years old should be replaced in the next five to ten years (2023-2028).

- The overall load for the plant cannot be determined for several reasons: historical metering is absent from SWGR-1A/B, the co-generation system (Co-Gen) connects directly to SWGR-2A (limiting the value of service entrance data at SWGR-2A), and the meter on SWGR-2B is broken. By replacing SWGR-1A/B as recommended, the overall plant load can be determined. Integration of the Co-Gen system with the remainder of the plant is outside the scope of this study.

  Co-generation complicates any load study. A potential solution to this complication is to receive metering data from the SWGR-1A/B and the co-generation source at the HMI system and sum them internally for historical tracking and trends. In the short term, a rough estimate of overall plant demand can be measured at the meters on the backup generators. Unfortunately, the generators failed when we tried that during the project.

2.0 CONDITION ASSESSMENT, GENERAL

These observations either apply to the incoming utility service or to the system as a whole. They involve assessments of equipment condition, but apply as condition trends across the plant, rather than isolated to a particular piece of equipment.

2.1 Power Supply from external sources: Utility and Co-Generation

FP&L supplies power to SEWRF at 480 volts (V), by way of two 1,500 kVA transformers that are both connected to the same FP&L circuit. The service transformers are located in a utility vault room within the Electrical Building, adjacent to the main Electrical Room where the main circuit breakers are housed. Each of the transformers supplies one assembly of low voltage switchgear with two circuits of service conductors: each circuit connects to one side of the switchgear (which has two buses, A and B, separated by a tie circuit breaker). Refer to drawing EMP-2018 (Appendix B) for an Overall One Line Diagram of the existing plant.

Five-years of outage data from your FP&L feeder reveals that momentary outages (less than 60 seconds) peak at 2.4 outages/month from May through September (during storm season), while they average 0.5 outages/month for the rest of the year. In total, the SEWRF experiences about 18 momentary interruptions per year. Sustained outages (more than 60 seconds) occur at 0.6 times per year, lasting for about 0.5 hours. The sustained outage pattern is low, relative to other FP&L customers in the same service territory, and the pattern of momentary interruptions is high (perhaps due to lightning strikes at the neighboring landfill, which is the tallest land for miles).

A second power supply is provided from an independent power producer, SCS Energy of Long Beach, CA, who owns and operates an onsite generator that burns methane from the neighboring landfill. The co-generation system (Co-Gen) provides a relatively constant output (1400 - 1700 Amps; or 1200 - 1600 kW) of inexpensive electricity to the SEWRF. However, this power source is non-islanding and only generates when connected in parallel to FP&L and therefore cannot be used as a standby power source.. Standby power for outages is provide by diesel engine generators, as discussed below, and the reliability of the Co-Gen system is outside the scope of this study.

2.2 System Architecture: Switchgear, Generators, & Gen Switchgear

The architecture of the SEWRF's power distribution system organizes its loads mainly by utility transformer, grouping most of the treatment process loads on SWGR-2A/B and most of the effluent pumping (MARS) loads on SWGR-1A/B (though this distribution philosophy isn't applied consistently). Separate from SWGR-1A/B and SWGR-2A/B there are four circuit breakers connected to the three generators, with Generators 1 & 2 providing standby power for SWGR-1A/B and Generators 2 & 3 providing standby power to SWGR-2A/B (see drawing EMP-2018 in Appendix B).

Carollo disfavors this arrangement because the configuration creates an unnecessary dependence on each of the utility transformers, because failure at either transformer eliminates the availability of utility power at one of the switchgear line-ups and all of its associated loads. Standby power from the SEWRF's generators is still available during a transformer failure, but the utility service would be more reliable for the plant as a whole if both utility transformers came into the same switchgear: One transformer dedicated to each side of a split-bus switchgear. An arrangement like this would also have more operational versatility - and it would be better able to distribute power from standby generators and Co-Gen.

Currently each switchgear line-up has a dedicated standby generator (Generator 1 for SWGR-1A/B and Generator 3 for SWGR-2A/B), additionally both switchgear line-ups are capable of receiving standby power from Generator 2 (see drawing EMP-2018 in Appendix B). Generator 1 connects to SWGR-1A/B through a dedicated generator breaker. Similarly Generator 3 connects to SWGR-2A/B through a dedicated generator breaker. Generator 2 has 2 breakers one that connects to SWGR-1A/B and the other connects to SWGR-2A/B. None of the generators are paralleled to one another. Generator 1 is capable of supplying all SWGR-1A/B demand load (if the tie breaker is closed), similarly Generator 3 is capable of supplying all SWGR-2A/B demand load. Generator 2 can supply power to either or both SWGR-1A/B or SWGR-2A/B up to it rating; however, if Generator 2 was to simultaneously supply power to both SWGR-1A/B and SWGR-2A/B the plant staff would have to monitor its loading and manually shed load in order to not overload the generator.

While this arrangement is effective at providing sufficient standby power to plant loads, it does so expensively, requiring the plant to maintain 6000 kW (7,500 kVA) of generator capacity for processes that are adequately supplied by 3000 kVA of utility transformers. A simpler, less-expensive arrangement would integrate two generators at a single assembly of generator switchgear, rather than maintaining three generators and two generator switchgears. A single assembly of paralleling generator switchgear, if connected to a transfer bus (between the two load bus wings of the switchgear), could make standby power from two generators available to run the entire plant. Deferring the replacement of Generators 1 & 2 would save the County a lot of money, and avoiding the replacement of Generator 3would save the County ~$1.5 million dollars.

2.3 System Architecture: Redundancy Loops between Twin MCCs

SWGR-1A/B and SWGR-2A/B directly power large VFD-driven loads. The remainder of distribution circuits from SWGR-1A/B and SWGR-2A/B feed motor control centers (MCCs), which in turn power process loads, building loads, and panelboards. This type of power distribution system is termed “radial." The alternative to "radial" distribution is "loop" distribution, where power is distributed from two breakers in the switchgear through a series of switches with taps for feeders between them. The “loop” distribution system essentially provides two sources of power to each load. Radial connections are simple, inexpensive,

and less reliable; loop connections are more complex, expensive, and reliable. While the SEWRF uses radial supply between service switchgear and MCCs, it does establish loop redundancy by connecting "twin-pairs" of MCCs together through a tie circuit breaker.

The benefit of the SEWRF's existing distribution system is that it gives each pair of MCCs (MCC-1 & 2, 3 &4, 7 & 8, and 11 & 12) are supplied from two feeder circuits, when the Ties are cloased. For example: MCC-1 has one feeder from SWGR-2A; MCC-2 has one feeder from SWGR-2B; and a tie between the two MCCs gives either one access to either side of SWGR-2. Each paired MCC is normally supplied from opposite sides SWGR-2 , and neither of these MCCs may be powered from SWGR-1 (or its FP&L transformer or Generator 1).

Redundant feeder circuits powering paired MCCs that have a tie breaker address some of the single point of failure concerns. The standby engine generators in conjunction with their associated FP&L transformers address the other single point of failure concerns. However, additional reliability could be achieved by sizing each FP&L transformer to power the entire plant load with each feeding separate ends of the same switchgear with tie breakers in between as depicted on EMP-2019 (see Appendix C). The replacement of SWGR-1A/B introduces this opportunity, and our recommended solution is explained below in the description of that project.

2.4 System Architecture: Co-Generation and Biosolids

The Co-Gen system is connected to the A-bus of SWGR-2A/B. It's not clear to Carollo how this system is integrated into the control, metering, and protection scheme of SWGR-2, but we see some problems with the configuration. First of all, it appears that the Co-Gen circuit breaker is intended to protect SWGR-2A at its ampacity (3200 A), but that its current transformer (CT) measurement is not summed with the CTs on its FP&L input at the Main Circuit Breaker to bus SWGR-2A (which is set for 3000 A). As such, it's possible that the process could draw current in excess of the switchgear's 3200 A capacity. A second problem with the Co-Gen system is that only SWGR-2A/B loads have access to it: if co-generation exceeds the loads on SWGR-2A/B and the County uses it at SWGR-1A/B, then the County would end up paying for the power twice: once from the Co-Gen supplier at SWGR-2/AB - and then again at SWGR-1A/B from FP&L (or possible at Biosolids MCC-1BSD, which is on a separate FP&L service entirely. We can't know when this problem occurs right now, because of the metering problems, but it might be happening any time Co-Gen supply exceeds the demand on SWGR-2A/B.

A third problem with the Co-Gen system, related to the second issue, is that the metering of the overall system does not give the plant accurate data for monitoring its loads. This is discussed further below, in Section 2.05.

Another aspect of the system architecture that's worth mentioning is that there's another service entrance in addition to the two FP&L services that were described above. The Biosolids Dryer building receives its own FP&L service directly into a 1600 A motor control

center. With its own, autonomous service, this building has no access to SEWRF standby capacity or less expensive Co-Gen power, and is inherently less reliable than the remainder of the plant (though this isn't a major concern though, as the Biosolids function is not critical). The arrangement is also problematic for having the service conductors connected directly from the utility transformer secondary to MCC-1BSD, because transformer secondaries have the most energy available for (and slowest protection against) arcing faults.

The County has expressed interest in having MCC-1BSD supplied from the same service switchgear as the rest of the plant, which would solve both problems (of having an upstream service disconnect and providing access to Co-Gen and standby generators). However, Carollo is concerned about available capacity at the service switchgear, which might be near 3600 A on a 4000 A bus, if its recommendations are followed to consolidate the service entrances into one assembly. As such, Carollo recommends that the County address its metering problems first to acquire a more accurate sense for the true demand load of the plant. If the data is favorable, then it might make sense to look at supplying MCC-1BSD from a new SWGR-1A/B.

2.5 Metering Problems at Switchgear

The overall load for the plant cannot determined for several reasons: historical metering is absent from SWGR-1A/B, the meter on SWGR-2B is broken, and the Co-Gen system connects directly to bus SWGR-2A without a local meter display (and this significantly limits the value of service entrance data at SWGR-2A). The Co-Gen system, in particular, complicates the metering scheme because it can lead to positive or negative flows through the main circuit breaker of bus SWGR-2A, and it's not clear that the two sources have been properly integrated to reflect the arrangement. This issue is problematic because the NEC sizing rules require that a project adding load demonstrate bus capacity by calculations (which presently indicate more connected load than switchgear capacity) or historical metering (which always has more favorable numbers than the sum of connected load).

Carollo recommends that a historical, digital meter be provided for each source (including generators and Co-Gen), that the data be received at the SCADA system, and that the sources for each bus are summed by SCADA for historical tracking and trends of power consumption at each switchgear bus.

2.6 Power Quality Problems at MCCs

Digital metering is present at 8 MCCs out of 16 total. These digital meters log historical highs and display measurements of power factor, harmonic current distortion, and harmonic voltage distortion. A survey of those meters found that power factor was low throughout the plant: the typical range was 0.75 to 0.85, with some buses as low as 0.25 at the time of observation. The harmonic content of voltage and current were low on most buses, in the

range of 1-3%, but the harmonic current on MCC-11 was found to be 35%, a very high value.

The measurements of low power factor can probably be attributed to the failure of power factor correction capacitors around the plant, leaving several large, across-the-line loads without a local source for their reactive power requirements. The measurement of high harmonic current at MCC-11 can be attributed to the two 75 HP, 6-pulse, variable frequency drives (VFD) for the RAS pumps, neither of which have a line reactor (or other harmonic mitigation). The County could address these problems by replacing (and maintaining) its failed power factor correction capacitors, installing of new 3% (min) line reactors for all VFDs, performing maintenance testing on your ground system, installation of digital power meters where they're not provided, and monitoring the power quality metrics with the existing meters.

3.0 CONDITION ASSESSMENT, ELECTRICAL EQUIPMENT

3.1 History of the SEWRF Power System

Carollo Engineers performed a condition assessment of the SEWRF's electrical distribution equipment, including a review of record drawings from the original construction in 1989, the major "WWTP Expansion" project in 2002, and the "10 MG Storage Tank & Interconnection" project in 2017. The following is a summary of the major electrical system projects completed or in construction since the 1989 construction:

- In 1989, the original plant was built with SWGR-1A/B (manufactured in 1986) supplying the entire process via MCCs, with one 750 kW generator connected to lugs on bus SWGR-1A. Original MCCs 1, 1A, 2, 2A (in 2002 and 2013) have all been replaced; original MCCs 3 and 4 were re-labeled MCCs 9 and 10 (in 2000); and original MCCs 5 and 6 are still in-service. Many original panelboards are also still in-service.

- In 1995, Generator 1, Generator 2, and Generators 1 & 2 Switchgear were all installed, connecting Generator 1 to bus SWGR-1A and Generator 2 to bus SWGR-1B.

- In 2002, the electrical system was expanded to connect new Effluent Pumps at SWGR-1A/B and provide SWGR-2A/B as the power source for several new MCCs to supply the equipment additions of the expanded process (present MCC-1, MCC-2, MCC-3, MCC-4, MCC-7, MCC-8, MCC-11, and MCC-12). Generators 2 & 3 Switchgear and Generator 3 were also provided at this time, realizing the switchgear configuration that's in place today.

- In 2007, the Biosolids Dryer building was added, with a new FP&L service to MCC-1BSD.

- In 2013, the co-generation system was connected to bus SWGR-2A, providing the plant with electricity generated from landfill gas.

- In 2016, the septage receiving station was installed, including new MCC-SEP that is fed from MCC-1.

- In 2017, the 10 MG storage tanks were commissioned, replacing the previous large effluent pumps with the new pumps for High Service (four pumps at 400 HP each) and Low Service (five pumps at 100 HP each). New MCC-13 & MCC-14 installed.

- 2018: refer to the Summary of the Condition Assessment, below.

3.2 Summary of the Condition Assessment of Electrical Equipment

Table 2 Condition Assessment, SEWRF Major Electrical Equipment

Equipment	Function in Distribution System	Year of Manufacture, Physical Condition	Location	Action Recommended
SWGR-1A/B	Service entrance switchgear. Supply for MCCs 9, 10, 5, & 6, and for 3 of 4 High Service Pumps,	1986 Poor. Hot spots found with thermal imaging (repaired 2016). No written procedure for switching operations. Door clasps loose and status lights out on a few cubicles.	Main Electrical Room	Replace assembly as soon as possible. Replace both Generator Switchgear assemblies at the same time. Connect new Generator Switchgear to transfer bus of new SWGR-1A/B. Connect one FP&L transformer to each side of new SWGR-1A/B. Leave space for future additions, when it's time to replace SWGR-2A/B. Replace service entrance cables to SWGR-2A/B with new feeder circuits from new SWGR-1A/B.
SWGR-2A/B	Service entrance switchgear. Connection of Co-Generation Supply for MCCs 1, 2, 3, 4, 7, 8, 11, 12, & 13; and for 1 of 4 High Service Pumps,	2001 Good. Faulty meter 2B. Poor integration of Co-Gen circuit breaker. Mislabeling between protective functions and existing documentation.	Main Electrical Room	Repair or replace both power meters. Incorporate all power sources metering (utility, Co-Gen, and generators) into SCADA system for historical tracking. Replace service entrance cables to SWGR-2A/B with new feeder circuits from new SWGR-1A/T/B. Replace assembly in 2032 (as mentioned above for SWGR-1A/B). Replace or remove in 2032 (with additional vertical sections on SWGR-1A/B to supply loads currently fed by SWGR-2A/B).

Table 2 Condition Assessment, SEWRF Major Electrical Equipment				
Equipment	**Function in Distribution System**	**Year of Manufacture, Physical Condition**	**Location**	**Action Recommended**
Generator 1	2000 kW Standby Power	1995 Good. Lightly used. Exercise is irregular. Staff has reported "generator batteries blowing up during a recent exercise." Carollo witnessed an electrical short circuit at the fuel day tanks during an exercise in May.	Generator Room	Exercise regularly. Keep up with routine maintenance. Have Ring Power perform in-depth technical analysis (including oil analysis and fuel usage) every 3 years. Replace generator in 2035.
Generator 2	2000 kW Standby Power	1995 Good. Lightly used. Exercise is irregular.	Generator Room	Exercise regularly. Keep up with routine maintenance. Have Ring Power perform in-depth technical analysis (including oil analysis and fuel usage) every 3 years. Replace generator in 2035.
Generator 3	2000 kW Standby Power	2001 Good. Lightly used. Exercise is irregular.	Generator Room	Exercise regularly. Keep up with routine maintenance. Have Ring Power perform in-depth technical analysis (including oil analysis and fuel usage) every 3 years. Retire Generator 3 once Generators 1 & 2 are paralleled. This assessment should be re-visited once the plant's demand load pattern is verified.

Table 2 Condition Assessment, SEWRF Major Electrical Equipment

Equipment	Function in Distribution System	Year of Manufacture, Physical Condition	Location	Action Recommended
Generators 1 & 2 Switchgear	Connecting Generators 1 & 2 to SWGR-1A/B	1995 Good. Indicator lights out. Poor documentation of system and switching procedures.	Main Electrical Room	Replace with a new Generator Switchgear assembly (SWGR-GEN) for two of the generators at the same time as replacement of SWGR-1A/B. This may require generator modifications to the governors, governor controllers, and voltage regulators.
Generators 2 & 3 Switchgear	Connecting Generators 3 & 2 to SWGR-2A/B	2001 Good. Poor documentation of system and switching procedures.	Main Electrical Room	Replace with a new Generator Switchgear assembly (SWGR-GEN) for two of the generators at the same time as replacement of SWGR-1A/B. This may require generator modifications to the governors, governor controllers, and voltage regulators.
MCC-9, MCC-10, MCC-5, and MCC-6	Supplies power to solids handling, filters, and two plant drain pump stations.	1986. Poor.	Belt Filter Press Electrical Room	Remove equipment and replace with new, including digital meters for each MCC.
MCC-1, MCC-2, MCC-3, MCC-4	Supplies power to EQ basin, headworks, aerators, aeration basin mixers, RML pumping, and two plant drain pump stations.	2000. Good. Capacitors bad. NEC violation on OCP to MLR pumps.	Headworks /Aeration Basin Electrical Room	Repair or replace power factor correction capacitors. Replace motor circuit protectors on feeder circuit to VFDs (for MLR pumps) with molded case circuit breakers (for OL protection, in addition to short circuit). Replace equipment in 2030 (or sooner, depending on the 4th basin).

Table 2 Condition Assessment, SEWRF Major Electrical Equipment

Equipment	Function in Distribution System	Year of Manufacture, Physical Condition	Location	Action Recommended
MCC-7, MCC-8, MCC-11, MCC-12.	Supplies power to sludge thickening, filters, and two plant drain pump stations.	2000. Good. Mislabeling. Low power factor.	Headworks /Aeration Basin Electrical Room	Install power factor correction capacitors or VFDs for sludge blowers. Stock spare parts for auto-transformer starters on sludge blowers. Remove equipment and replace with new in 2030.
MCC-1A, MCC-2A	Supplies power to headworks and odor control	2013. Good. No power meters, but sub-fed from adjacent MCCs 1, 2 (metered).	Headworks /Aeration Basin Electrical Room	Replace equipment in 30 years - or possibly earlier when MCC-1 and MCC-2 are replaced (to consolidate space and update technology).
MCC-13, MCC-14	Supplies power to MARS system (low service and HS jockey pumps)	2015. Good.	MARS Electrical Room	Replace equipment in 30-years..
Panelboards & Transfer Switches	Supplies power to non-continuous loads for process & auxiliary loads.	Varies: 1989 - 2016 Varies: poor to good.	Throughout plant	Maintain circuit breakers per NFPA 70B. Replace as indicated in project descriptions. Dry-type transformers can stay in-service for the life of the building.
VFDs for RAS Pumps (3)	Separately-mounted VFD starters for RAS pumps	2000. Good.	Main Electrical Room	Replace these with the RAS/WAS rehabilitation schedule for 2018. When replacing, provide 5% line reactors and DC bus chokes to protect the VFDs from upstream voltage surges and mitigate harmonic currents.

Table 2 Condition Assessment, SEWRF Major Electrical Equipment

Equipment	Function in Distribution System	Year of Manufacture, Physical Condition	Location	Action Recommended
VFDs for WAS Pumps (4)	Separately-mounted VFD starters for RAS pumps	2000. Good.	Main Electrical Room	Replace these with the RAS/WAS rehabilitation schedule for 2018. When replacing, provide 5% line reactors and DC bus chokes to protect the VFDs from upstream voltage surges and mitigate harmonic currents.
VFDs for MARS (HS, HS Jockey, and LS Pumps)	Separately-mounted VFD starters for MARS pumps	2015. Good.	Main & MARS Electrical Rooms	Replace these in a "VFD Replacements Project" in 2035. When replacing, provide 5% line reactors and DC bus chokes to protect the VFDs from upstream voltage surges and mitigate harmonic currents.
VFDs for RML Pumps	Separately-mounted VFD starters for RML pumps	2000. Good.	Gallery between Aeration Basins	RML pumps and VFDs will be demolished in 2020 with the Anoxic/Aeration Basins Enhancements project.
VFDs for Sludge Thickening Pumps (301, 302, 303, 304, 306)	Separately-mounted VFD starters for sludge thickening pumps	2000. Good.	Sludge Thickening Electrical Room	Replace these with an Arc Flash Mitigation project or Electrical Upgrade project in the timeframe of 2019-2020. When replacing, provide 5% line reactors and DC bus chokes to protect the VFDs from upstream voltage surges and mitigate harmonic currents.
VFDs for Sludge Thickening Pumps (305, 307, 308)	Separately-mounted VFD starters for sludge thickening pumps	2013. Good.	Sludge Thickening Electrical Room	Replace these in a VFD Replacements project in 2035.

3.3 Equipment Vulnerabilities: SWGR-1A/B

Manufactured in 1986 by Westinghouse, service entrance switchgear SWGR-1A/B is past its useful service life. Staff spoke of "hot spots" that the service contractor found during thermal imaging in 2016, and the loose connections have been corrected. Visual inspections at the site visit also found door clasps loose and status lights out on a few cubicles. The existing circuit breakers are from the discontinued Westinghouse line of "SPB" insulated case circuit breakers, using Pow-R-Trip 7 digital trip units. The metering on these assemblies is only an analog voltmeter and ammeter that measures the instantaneous voltage and line current from FP&L. No historical data is available to indicate the peak demand load and the connected load is at the 3200 A capacity of the bus, so adding any load to this switchgear would require a load study in accordance with the requirements of Article 220 of the National Electrical Code. The battery charger and batteries for control power appear to be as old as the switchgear itself, and should be replaced with the switchgear.

Most of the SEWRF's effluent pumping capacity is supplied from SWGR-1A/B - although one 400 HP High Service Pump could still be run from SWGR-2A/B during an outage at SWGR-1A/B. Considering this, the age, and the condition of SWGR-1A/B, this switchgear represents a vulnerability to the reliability of SEWRF's mission to deliver treated wastewater for re-use. The tanks for 10 MG Storage mitigate the vulnerability somewhat, as the plant would be able to store treated wastewater during outages that disrupt its capacity to distribute to its re-use (MARS) network, but that's a short term solution to maintain a minimal amount of throughput. This switchgear should be replaced as soon as possible.

3.4 Equipment Vulnerabilities: SWGR-2A/B

Manufactured in 2001 by Cutler-Hammer and installed in 2002, service entrance switchgear SWGR-2A/B is DSII Metal-Enclosed LV Switchgear. The switchgear itself it in good working condition, with an undamaged enclosure that is free of corrosion. Being located in an air-conditioned space that's sheltered from weather and other damage, this assembly should be suitable to remain in service until 2032, when it should be removed for deteriorating insulation, less reliable overcurrent protection, corrosion on electrical contacts, and availability of spare parts. However, problems with this switchgear have been observed that should be corrected to enable it to continue functioning reliably for the remainder of its service life - particularly considering the critical role that this switchgear has in powering nearly all of the SEWRF wastewater treatment processes.

Staff have reported "hot spots" in SWGR-2A/B that were found by the service contractor during the annual thermal imaging that they perform (upstream of the feeder circuit to MCC-2), and the loose connections identified in these scans have been corrected. While thermal imaging is an important step of routine preventive maintenance, the SEWRF should also perform the cleaning, inspection, and testing recommendations of NFPA 70B and the equipment manufacturer.

Another concerning set of issues for SWGR-2A/B are the metering issues discussed above. In short, the Co-Gen supply has no metering that's visible to the plant, and for that reason it's impossible to know if the digital metering on the FP&L service to bus A of SWGR-2 represents the demand load or only the demand load that exceeds the Co-Gen supply. The digital meter on the FP&L service to bus B is defective and should be replaced. A short-term solution to provide better distribution for the Co-Gen power would be to operate SWGR-2A/B with the tie breaker closed and only the main circuit breaker to bus A closed.

Labeling errors were found on the meters and protective relays on the face of the switchgear. The Basler BE1-47N protective relay for "voltage phase sequence" is labeled as 24/47-2, though protective function 24 (Volts/Hertz) is not available on the relay - while undervoltage (27) and overvoltage (59) protection both are. Likewise, the power meter is labeled 27/47-2, though it's doubtful that this relay is integrated to provide protective functions. Errors were found in the existing documentation compared to the factory drawings for this switchgear, but the new set (provided with this Electrical Master Plan) has been corrected.

3.5 Equipment Vulnerabilities: Generators 1, 2, & 3

Cummins manufactured Generators 1 & 2 in 1995 and Generator 3 in 2001. Carollo's investigation into generator operation was limited due to equipment failures and the availability of switching procedures, but those observations themselves are instructive.

During a generator exercise in May 2017, Carollo witnessed an electrical short circuit occurring in the fuel day tanks for two of the three generator units. These equipment failures were not an isolated incident, as staff reported an event of having the generator batteries "blow up" recently during a generator exercise. These problems with the generator system auxiliaries indicates that generator maintenance is not being kept up and that the units are not regularly exercised. For maintenance, inspections should be performed and levels should be replenished for lubrication, cooling, fuel, battery, and exhaust systems. Manufacturer's recommendations should be referenced for more detailed on maintenance practices.

Generator exercising, though performed under plant load, has not been performed consistently. Staff reported that they did not exercise the generators for a long time, but had recently resumed the practice. The renewed practice involved a schedule of running two of the three generators each month (units 1 & 2 in one month, 2 & 3 in the next month, 3 & 1 in the following month, etc). Monthly exercise is critical to keep engine parts adequately lubricated, inhibit oxidation of electrical contacts, and use fuel before it deteriorates.

Co-Gen only works when the plant is connected to FP&L; the Co-Gen system is not designed to parallel with the plant's standby generators. Conversely, the standby generators do not parallel with the utility, and transitions between standby generators and FP&L are open (with no overlap period to maintain power for the facility when the switching from utility power to standby - or vice versa). This transition to and from standby generators is a fundamental aspect of operating the equipment that the operators should be aware of, and which should be reflected in detailed operating procedures. When Carollo tried to perform a routine generator exercise on-site with

plant staff, a written operating procedure wasn't available and we had to call a retired, former employee, to proceed. This substantiates that periodic exercising of the standby generators has not been occurring. A written operating procedure was discovered after Carollo left, but it should be easily available to plant staff (and it included inadvisable directions, such as exercising one generator without load each month - which conflicts with manufacturer recommendations).

While the generator problems discussed above undermine the reliability of the SEWRF's standby power supply, a palliative to this vulnerability is that the plant has 6000 kW of generator capacity to dispatch from three units. This makes it more likely that at least two units will be available to serve when called upon. The County's local Caterpillar representative, Ring Power, reports that these generators can stay in service for 40-50 years (or more; they have old machines in-service that were installed in the mid-1960s). Each of the three SEWRF generators are Caterpillar's model 3516, which is one of their most popular models - with widespread availability of spare parts expected far into the future (product obsolescence is not foreseen at this point). Ring Power advises that, to achieve that kind of longevity from its generators, the County's maintenance plan for these units should follow Caterpillar guidelines.

Considering Ring Power's perspective, Carollo's first recommendation regarding the generators is that the County maintains these units to get 40 years of service from Generator 1 and 50 years of service from Generator 2. In addition to the diligent maintenance recommended above, the County should have Ring Power perform an on-site, in-depth technical analysis on all of its generators. This inspection should include oil analysis and a retrieval of fuel usage data from the generator's on-board controller. This data enables them to see how hard the machine was driven and identify any engine problems before they become detrimental. If this strategy is pursued, the County could expect to replace Generator 1 in 2035 and Generator 2 in 2045.

While Generator 3 is younger than the other two units by 6 years, its internal windings have a different pitch than units 1 and 2 - making it more difficult to parallel them together (as recommended below). With the plant's largest motors all run from VFD or RVAT starters, that means that the "overcapacity" in generators (see Section 2.2) is not needed for motor starting requirements. As such, Carollo's recommendation is that the County not use Generator 3, by either: 1) abandoning it in place, "winterizing" it until a generator is needed elsewhere in the County; 2) keeping it in-service as a standby unit that is not paralleled with Generators 1 & 2 (but still connected to the SWGR-GEN); or 3) selling it.

Carollo's design philosophy, in this regard, is to provide enough generator capacity to run the entire plant in the event of a utility failure: considered an "N" level of redundancy in standby generators. The utility service and two paralleled generators would make N+1 redundancy, and the present arrangement of utility service and three generators could be considered N+2 redundancy. Our experience has been that N+1 redundancy is most common at Florida plants and around the United States. Another factor is that MARS pumping, which represents half of the plant load, can be provided from the NEWRF or SWWRF in the unlikely event that a FP&L failure at SEWRF is coincident with a failure of one of your standby generators. An N level of redundancy is less expensive to provide, maintain, and replace than an N. The recommendations in this report develop that philosophy over the course of several projects.

3.6 Equipment Vulnerabilities: Two Assemblies of Generator Switchgear

Generators 1 &2 Switchgear (G12-SWGR) was manufactured in 1995 and Generators 2 & 3 Switchgear (G23-SWGR) was manufactured in 2001. At the time of Carollo's inspection, Generator 1 had been run for 491.3 and Generator 2 had been run for 243 hours. This translates to about 2 hours of operation per month for each generator, suggesting that the generator exercising habits mentioned in Section 3.4 are a recent aberration; that exercise has been mostly diligent for the history of the equipment.

Site visit observations found both of the Generator Switchgears to be in good condition. G12-SWGR had an active alarm for "Low Fuel Level Day Tank" on Generator 2 from the last time, a month previous, when the generator ran, and that it shut down the generator. This raises the questions: why is the alarm light still on, is there any remote notification, and how does fuel get ordered? A month should be plenty of time to address low fuel level. A push test on the G12-SWGR annunciator also found that the "Generator 2 CB Open" light is out and the "Control Voltage Failure" (for Unit 1) light is out. The standby power system should be considered a critical system with a high priority level for maintenance; any issues concerning the standby power system should be immediately addressed.

Looking only the age and condition of G12-SWGR and G23-SWGR, the equipment is suitable for a full 30 years of service. Unfortunately, their functionality is not well-matched to the present demands of the plant. Specifically, neither G12-SWGR nor G23-SWGR is able to synchronize its generators together to operate in parallel; so none of the generators are able to share duties for powering the plant. This is because the switchgear bus of Generator 1 is not physically attached to the switchgear bus of Generator 2 inside the G12-SWGR assembly (obviously, paralleling controls are absent as well). The same is true of the G23-SWGR. Instead of paralleling the generators, Generator 1 is dedicated to the A-bus of SWGR-1A/B and Generator 3 is dedicated to the B-bus of SWGR-2A/B. In both cases, a single generator could supply power to both buses of its own assembly if the tie circuit breaker is open, but neither can share the load duties with another generator. In total, the plant has four independent switchgear buses in two switchgear assemblies receive power from three standby generators. It's a confusing arrangement that's difficult for staff to use effectively. In addition, it requires over-investment in generators to make enough power available to back up all processes.

Considering the observations just described, the required replacement of SWGR-1A/B, and the benefits of improving distribution of the SEWRF's standby generators, Carollo recommends replacing this equipment early, at the same time as SWGR-1A/B. These two assemblies (G12-SWGR and G23-SWGR) should be replaced with one assembly, instead of two, that is capable of paralleling Generators 1 & 2. That paralleling generator switchgear will be referred to as SWGR-GEN in this report. The County may wish to keep Generator 3 available for non-paralleling duty - and possibly a load bank for exercising it - in which case another two circuit breakers might be needed in SWGR-GEN, but the primary purpose for the switchgear is to parallel Generator 1 and Generator 2 for distribution to the plant.

The reason that Generator 3 is difficult to parallel to the other two is the pitch of the generator windings. The two units from 1995 have pitches of 0.7619, and the generator from 2001 has a pitch of 0.6667. Ideally, paralleling is most easily achieved between generators whose pitch matches, so it's more complicated to parallel the 2001 unit with the two others. It is possible for generators with mismatched pitches to be paralleled, but Ring Power has had bad experience with the multiple winding reactors - and a 3rd generator is probably not needed (because of good utility power, N+1 redundancy, and the ability to serve MARS loads from elsewhere).

Carollo recommends that the County provide paralleling switchgear (SWGR-GEN) when replacing SWGR-1A/B, and making a connection to the service switchgear (SWGR-1A/T/B) at a transfer bus between two tie circuit breakers. (see drawing EMP-2019 in Appendix C). Although this is ahead of schedule for the typical 30-year replacement cycle, it would be more operationally flexible, easier to use, as reliable, and less expensive (long term) than the current configuration.

3.7 Equipment Vulnerabilities: Original Motor Control Centers

Built in 1986, MCCs -5 and -6 are past their expected 30-year service life, especially considering the humid environment in which they operate. In equipment this old the insulation deteriorates, creating the potential for short circuits and arc flash incidents, the reliability of the overcurrent protection degrades as factory-lubricated mechanisms dry out over time, and repairs can be longer and more costly when spare parts aren't available. These motor control centers are critical to the operation of the solids processing performed by the SEWRF's belt filter presses, and their age and poor condition compromises reliability.

The situation for MCC-9 and MCC-10 is similar to that of MCCs -5 and -6: both are 30 years old, past their expected service life. In addition, these MCCs have an inadequate short circuit rating for the application, and they've had instances when circuit breakers failed to open on short circuit faults. They're closely linked, as well: MCC-9 (which was probably originally labeled MCC-3) is the power source for MCC-5 and MCC-10 (originally labeled MCC-4) is the source for MCC-6. All four MCCs are functional and safety liabilities, and they all should be replaced as soon as possible.

In 2018 the RAS/WAS rehabilitation project will replace the existing scum ejectors and air compressors with progressive cavity pumps, one pump (~10 HP) for each secondary clarifier, requiring four size-1 starters. Although these would ideally be supplied from MCC-11 and MCC-12 (which are in the Main Electrical Room) to match the clarifiers and RAS/WAS pumps, bucket space is not available there, and MCC-11 doesn't have room to add another vertical section. There is an existing FVNR starter for each scum ejector in MCC-10, implying that there is an underground conduit path from MCC-9 and MCC-10 to the RAS/WAS pumping area, which could be re-purposed for the new pumps.

Carollo recommends replacing MCC-9 and MCC-10 in the RAS/WAS rehabilitation project, and the replacement VFDs for the RAS and WAS pumps should be included in the replacement MCCs -9 and -10 (rather than having the units separately-mounted in the Main Electrical Room,

as they are now) to provide the cleanest installation. . This option would be less expensive than having them separately mounted, and the County could still connect to the existing conduit by a conduit extension to the new motor control center. This option, which would be less expensive than replacing the existing separately-mounted VFDs, is not reflected in the costs shown in Project Recommendations.

The outgoing feeder circuits from MCCs -9 & -10 to MCCs -5 & -6 should be extended to an upstream switchgear source: SWGR-2A/B, preferably. The placement of replacement MCCs -9 & -10 should take into account the conduit penetrations for the feeders to MCC-5 and MCC-6, so that they can be extended to a switchgear source without passing through the motor control center.

3.8 Equipment Vulnerabilities: Repair the MCCs Manufactured in 2000

Eight of the SEWRF's motor control centers were manufactured in 2000: MCCs -1, -2, -3, -4, -7, -8, -11, and -12. All are installed in a clean environment and in good condition. They all have digital metering and are operating within their ratings. They were installed as twin-pairs, with tie circuit breakers between MCCs -1&2, -3&4, -7&8, and -11&12. MCCs – 1&2 and 3&4 power the Aerators, Anoxic Mixers, RML Pumps, and EQ Pumps; MCC-7&8 power the Sludge Thickening Pumps; MCC - 11&12 power the Clarifier Drives, RAS/WAS Pumps, and Lake Gravity Filters. Together, those motor control centers are the branch circuit source for nearly all of the SEWRF water treatment processes, and as such they are critical to system reliability.

A common problem among these MCCs was low power factor, an indicator that the correction capacitors (PFCC), which are installed on the larger FVNR starters, have failed. This is also shown on the PFCC indicator lights. Carollo recommends replacing the PFCCs. MCCs -11 and -12 both have very low power factor and high harmonic current distortion: this should be investigated. The current distortion could be mitigated with input filters on the VFDs for the RAS/WAS Pumps, and a PFCC on the RVAT for the Air Scour Blower might fix the power factor. Alternatively, an active harmonic filter could solve both problems.

Considering the criticality of these MCCs (1, 2, 3, 4, 7, 8, 11, & 12) for another 12 years, Carollo recommends maintaining spare parts for these units, especially for the RVAT starters for the Sludge Blowers, which were being repaired on several visits. Other minor problems are mentioned below under Short Term Improvements, and won't be repeated here.

3.9 Equipment Vulnerabilities: Replace the Original Panelboards

The remaining "original" panelboards and transfer switches that were manufactured in 1986-1989 should be replaced. Metal parts of old equipment become corroded, including electrical contacts and other conductive materials; insulation deteriorates, and mechanisms fail. Problems of circuit breakers failing to open have already been reported at the SEWRF, so their reliable operation cannot be assumed. A simple short term correction for this issue is to open and close all of the circuit breakers in the plant to verify that all of them operate. Generally speaking, Carollo recommends that panelboards and transfer switches be replaced after 30 to 40 years of

service life. Refer to the SEWRF Equipment Condition Assessment table for projected replacement year of each panelboard, which are grouped together with other projects.

3.10 Equipment Vulnerabilities: Plan to replace VFDs at 20-year intervals

Variable frequency drives (VFD) can have a service life from 9 years to over 20 years, depending on the duty to which they're subjected and the environment in which they're installed. Just as the corrosion of metals and deterioration of insulation happens to circuit breakers, VFDs have the additional problem of high frequency electrical switching that's required for the technology to chop up a sine wave of electricity and reconstruct it as an approximation of a sine wave. Considering that the SEWRF applications have clean environments without severe torque requirements or overloads - and that process loads are generally available with N+1 redundancy - Carollo recommends that the SEWRF plans to replace their VFDs at 20-year intervals.

4.0 PROPOSED RECONFIGURATION OF ELECTRICAL SYSTEM

With three generators connected through four independent circuit breakers in two different switchgear line-ups, to four buses of service switchgear, the SEWRF's power system architecture is not intuitive - making it inherently confusing to operate and maintain. The theme of these proposals is consolidation and centralization: consolidating two service entrance switchgears into one; and consolidating two generator switchgears into one.

4.1 One Service Entrance Switchgear with Three Buses

Due to the age and condition of the existing SWGR-1A/T/B, as described in the condition assessment, a new service entrance switchgear, SWGR-1A/T/B, is proposed to replace SWGR-1A/B in the same location (the bulk of the plant can already by powered by SWGR-2A/B). As shown on EMP-2019 (Appendix C), the new switchgear will be configured as the single point of connection for power from both FP&L transformers and for the standby generators. In the new arrangement, each FP&L transformer supplies one bus of SWGR-1A/T/B. Standby power connects between the tie breakers from a new Generator Switchgear (SWGR-GEN, see below). Co-Generation would remain connected at SWGR-2A. SWGR-2A/B will be fed from SWGR-1A/T/B rather than service circuits from FP&L transformers. All feeder circuits from SWGR-1A/T/B and existing SWGR-2A/B will remain as currently connected.

The new arrangement enables all plant loads to any load in the plant access to FP&L1, FP&L2, and SWGR-GEN through use of the tie breakers. Also, an outage (planned or unplanned) on any of the four switchgear buses would still provide the remaining buses access to all of its generating capacity. Similarly, an outage to any bus except SWGR-2A would retain access to Co-Gen power for the remaining two buses through the use of the tie breakers. Further, by being downstream from the service entrances, SWGR-2A/B could take outages without having energized conductors on the line side of the main breakers. A system that is convenient to take outages and intuitive to operate is safer, more reliable, and more available. Also, with the plant utilizing three different power sources (utility, co-gen, and standby), the network will be better-suited to distribute all three sources from a single switchgear assembly that still retains alternate circuit paths in the form of multiple buses and redundant feeders.

4.2 One Generator Switchgear to Parallel 2 Generators (with or without 3)

One-line drawing EMP-2018 (Appendix B) details the current configuration where the three generators are connected to four circuit breakers in two separate generator switchgear assemblies. One-line diagram, EMP-2019 (Appendix C), details a new generator switchgear, SWGR-GEN, that parallels all three units on a single bus. As discussed above in the Condition Assessment, the SEWRF could probably be run from two generators if they were "paralleled" to share loads on a common bus, but it's reasonable that the County would want to keep a spare standby generator and then would keep the third unit. Regardless, generator power would be much more widely available and easily dispatch-able if the units were networked in the manner described here.

The sequence of projects, dictates that the Generator system modifications occur at the same time as SWGR-1A/T/B in 2019. The 2019 switchgear replacement provides the advantage that either FP&L service would be available to the entire facility. Likewise the 2019 power system configuration makes the standby power system available to the entire facility through this service entrance switchgear. Therefore the standby power systems and service entrance switchgear projects need to be on the same timeline.

Carollo sees the biggest incentive to paralleling switchgear as the ability to eliminate the replacement cost for one generator, which would be ~$1.5 million dollars (though that cost wouldn't be incurred for several years, since the County already owns 3 generators at this plant). Granted, the paralleling switchgear will cost several hundred thousand dollars, but it will be much less expensive than replacing the third generator. If the County has a need for 2000 kW generator elsewhere at its utility facilties, then Generator 3 could be re-purposed for that application. Otherwise it could be sold or left in-place as a stand-alone unit that can't be paralleled with the other two generators.

4.3 Removing or Replacing SWGR-2A/B in 2032

SWGR-2A/B was manufactured in 2001 and installed in 2002, so in 2032 it will be 30 years old and due for replacement. One option would be for the switchgear to be replaced with a similar unit. In this scenario, the Co-Gen connection remains downstream of the same (A) bus as the FP&L main breaker to which it is tied (any other location for it is sub-optimal). Several features of this arrangement make it attractive: 1) the feeder connections and conduit are already in place; 2) with SWGR-2A/B downstream from SWGR-1A/T/B, any three (of the four) switchgear buses can serve power to their loads; and 3) it provides the plant with a second piece of distribution equipment that loads can migrate to when SWGR-1A/T/B is eventually replaced. Considering its potential to serve as replacement when the service switchgear SWGR-1A/T/B is retired, the replacement for SWGR-2A/B could be specified to "service switchgear" standards and expanded to include a transfer bus, becoming: SWGR-2A/T/B. In this instance, SWGR-2A/T/B could receive a feeder direct from SWGR-GEN. This configuration is not shown in master plan drawings, but would be very similar to EMP-2035 (Appendix E), but with a transfer bus between SWGR-2A and SWGR-2B.

The alternative to replacing SWGR-2A/B would be to eliminate it entirely, migrating all of its loads and Co-Gen to SWGR-1A/T/B, as shown on drawing EMP-2031 (Appendix D). The remainder of SWGR-2 loads would be migrated to SWGR-1. The downside of this arrangement is that an outage to either bus would take out half of the plant. One benefit of this arrangement is that it would be relatively inexpensive to implement if the plant installs SWGR-1A/T/B with enough space to add five vertical sections between the two buses. Another benefit would be leaving a large space where SWGR-2A/B is currently located - accommodating the future work of replacing SWGR-1A/T/B/ with similar unit that could be installed concurrently with the existing one.

The execution of one of these options for SWGR-2 will be in 2032, but choices made during the replacement of SWGR-1A/B will impact the options that are available to the County when that

project is developed. Carollo's recommendation is to leave room for expansion when SWGR-1A/T/B is installed, but defer a commitment on SWGR-2 until a later date..

4.4 Retain Ties between Twin-Pair MCCs

With the improvements described above and the existing tie circuit breaker connections between MCCs, the SEWRF will have eliminated all single points of failure between the branch circuit protection of its MCCs and the supply circuit from all its four power sources, and it will have provided all loads in the plant with redundant paths to Co-Gen power, multiple utility transformers, and multiple sources of standby power.

4.5 New MCC and Electrical Building for Anoxic/Aeration Basin #4 in 2026

Several aeration solutions are being considered for the future fourth basin, and the electrical requirements will depend on which solution is selected. The estimate here presumes that the fourth basin will match the existing Basins 1, 2, and 3 without any return mixed liquor pumps.

The drawings indicate that existing MCC-4 was intended as the source for Aeration Basin 4. However, some of the space reserved for that basin's loads has been used for two equalization pumps and one equalization blower. MCC-4 is rated for 1200 A, and its maximum historical demand load is ~900 A. Because it is unclear whether that maximum is old or recent, all of the meters need to be reset as part of an improved data-gathering practice identified in the "Short Term Improvements" of 2019 (see Section 2.1). At this MCC in particular, resetting the meters will allow for a more accurate sense of available capacity. MCC-1 and MCC-2 appear to have more available electrical capacity, but space is a constraint for both, and it is not yet clear what electrical demand MCC-SEP will place on MCC-1.

Regardless of the available capacity of the MCC-4 bus, there is not enough room in the electrical room of the existing Aeration Basin/Headworks Building to add the starters for Basin 4. However, the replacement of all of the MCCs in that space (MCC-1, -1A, -2, -2A, -3, -4) is scheduled for 2030, and the starters for Basin 4 could be incorporated into that space if the schedule for replacement of those MCCs was moved up, from 2030 to 2026.

An alternative to locating the new loads into the existing electrical room at the Aeration Basin/Headworks Building would be to provide a new building between Basins 2 & 3 (or Basins 3 & 4) to house the distribution equipment for those areas as well as for Flow Equalization Tank 2. This option relieves space constraints in the existing electrical room at the Aeration Basin/Headworks Building; however, it does incur cost for the building, its supply circuit, and a PLC (or RTU) for that space. The costs of this a new building with motor control center, panelboards, and PLC cabinet are assumed in the cost estimate for this work (see Section 7.9).

5.0 OPERATIONAL IMPROVEMENTS

Beyond the physical plant of the SEWRF, Carollo's observation and study of the organization inform additional recommendations for operational improvements. This set of recommendations, if faithfully implemented, has the potential to improve the safety and reliability of the SEWRF - as well as minimizing its overall cost of ownership.

5.1 Establish a Stricter Practice of Maintaining Plant Documentation

Carollo found that SEWRF record drawings aren't easily accessible. In some cases, our investigations referred to intermediate submittals, bid drawings, and manufacturer's drawings instead of record drawings to represent a project's design, as it was installed. The staff was generous with what they had, but a number of things were missing from the drawing sets that were available - and errors were common between the documents and the field installation.

Another problem with the document record is that the electrical content is not well developed. This problem leaves you with a poor record of an installation, so the plant's drawings become difficult to use and difficult to maintain. These may even become a safety liability, since NFPA 70E requires employers to provide their staff with accurate drawings to use during job risk assessment and lockout/tagout procedures.

- Example: 10 MG Storage Tank, sheets E-0.4 and E-0.6 indicated upstream connections for the project's new motor control centers, but provided no one-line diagrams for MCC-13 or MCC-14. All MCCs should have one-line diagrams that are updated on subsequent projects as they're modified with changes that impact the expressed information.

- Example: Biosolids Dryer, Sheet-101, provides a schedule for the loads of a new MCC, but no new one-line diagram. In addition, the motor control center re-uses a tag that's already assigned to another distribution source on plant: MCC-1. This issue is discussed below.

Internally, Carollo recommends that the SEWRF improve its system of records management for project documentation. All of the documents should be centralized, controlled, and maintained - but still accessible and usable.

- Documents required for electrical equipment maintenance include:
    - Installation instructions
    - Disassembly/assembly (interconnection) drawings
    - Wiring diagrams, control schematics, and bills of materials
    - Equipment operation (for set-up and adjustment)
    - Maintenance recommendations by manufacturer (including parts list and recommended spares)

- Software programs and troubleshooting guides (where applicable)

- Documents required for execution of your Electrical Safety Plan are:
  - One-line diagrams
  - Coordination studies
  - Training documentation
  - Electrical Safety Plan
  - Training records for project team members

Externally, Carollo recommends that the County use explicit language in design contracts, if it's not in there already, for Consultants to provide completed one-line diagrams for each new switchgear or MCC - and for them to update the drawings of the equipment that is modified by their designs. Further, Contractors should be required to provide a Record Set of drawings that shows the final installation - including any deviations between the design drawings and the field work. If requirements for these services are already in the County's contracts, then the language should be enforced.

5.2 Create a Tagging System that Uniquely Matches Labeling to Drawings

Field investigation found inconsistent use of tagging throughout the SEWRF plant. Some equipment is not tagged at all, redundant tags exist for distribution equipment, and there appear to be mismatches between drawings and load equipment. This inconsistency results in confusion by plant staff, design consultants, and contractors who work with this equipment and poses a definite safety concern. Accurate and consistent tagging is a requirement of NFPA 70E, the *Standard for Electrical Safety in the Workplace*.

The County should create and implement a county-wide, standardized tagging system that can be provided to consultants and contractors for future work. A preliminary tagging standard for the SEWRF, and its application to the plant's equipment, were provided by Carollo; and a copy of the recommendations can be found in Appendixes F and G.

5.3 Define Plant Technical Standards and Preferences for Project Specs

Plant staff, expressed frustrations about their inability to control which equipment is provided for projects. They want to be able to eliminate some manufacturer's products while still maintaining competitive bids. They also want to standardize on communication protocols, instrumentation technology, and control system platforms that would enable them to limit the number of skillsets that their technicians are expected to work with.

Appendixes H, I, J, and K contain a sample set of Design Guidelines for this purpose, which is simply a series of lists of different types of equipment, providing a template to define Owner

preferences and present them to their consultants. Providing Design Guidelines to consultants will help with standardization and reduce the amount of disparate systems with the plants.

Carollo also has a few equipment-specific recommendations for all switchgear, switchboards, and motor control centers.

- Have the equipment manufacturer provided factory-installed voltage testing stations. This device facilitates the testing process that electricians use to verify the absence of voltage on distribution equipment. Having it eliminates several inconveniences of taking outages and can simplify your safety procedures.

- Where motor control centers and panelboards are in the same (or adjacent) room as their source, then eliminate the Main Circuit Breakers on those MCCs and panelboards. This forces electricians to open the upstream feeder circuit breaker when de-energizing equipment for maintenance, construction, and repairs. Provide Arc Reduction Mode (ARM) switches on main circuit breakers and major feeders. When working on energized equipment, an electrician can us ARM switches to reduce the duration (and hence severity) of a blast, if one does occur.

- Carollo does not currently have a recommendation on the "arc-resistant construction" feature of this distribution equipment. Arc-resistant MCCs have features to reduce the arc flash energy that's released in front of the assembly, such as: reinforced structures and frames to contain a blast; strong barriers between adjacent compartments, and channels to route blast energy out the top of the assembly (if one does occur). The County can judge the costs and benefits on their merits.

- Supplying non-continuous and non-process loads such as overhead doors, weir operators, valve actuators, and air conditioning equipment from motor controls centers is an expensive way to serve un-critical loads (see drawing 03E03 and 03E05 in Appendix A, for examples). Carollo recommends serving those devices from a panelboard, instead.

5.4 Implement the Electrical Safety Plan that Carollo provided in 2017

The OSHA General Duty clause essentially requires the OWNER to provide a safe work environment. The OSHA Standards incorporate NFPA 70 (the National Electrical Code) by reference, which in turn incorporates NFPA 70E. Therefore the requirements of NFPA 70E are used to provide specifics that must be met to comply with OSHA. NFPA 70E requires, among many other things, that the OWNER provide its staff with an ESP. SEWRF’s current practices do not appear to comply with the ESP, and in fact the ESP was not in use during the time of the field investigations. Therefore SEWRF's current practices do not appear to be compliant with the OSHA requirements.

In a previous project, Carollo was contracted to evaluate and review an Electrical Safety Plan that another consultant had provided to the County for its use. That investigation found several problems with the document, and Carollo provided another Electrical Safety Plan (ESP) for the

County's use. The document was written to the 2015 version of NFPA 70E (*Standard for Electrical Safety in the Workplace*), which was the prevailing standard at the time. The NFPA standard has advanced to a 2018 version, but the ESP is still worth implementing if the County is not ready yet to invest in developing an ESP to the 2018 standard. Regardless, OSHA requires updating your ESP every 3 years, so that update should be done by 2020.

5.5 Align the Electrical Preventive Maintenance program to NFPA 70B

Having observed issues with SEWRF documentation, tagging, generator maintenance, and safety compliance, Carollo recommends that the plant establishes an Electrical Preventive Maintenance Program (EPM) based on NFPA 70B: Recommended Practice of Electrical Equipment Maintenance. The standard is written to facilitate plants' efforts to optimize their investments by establishing a formal program to shift expenditures from expensive capital projects to less-expensive maintenance tasks, which appears to be the trend that the plant is moving in right now. Additionally, the NFPA Standard for Electrical Safety in the Workplace (NFPA 70E) includes a requirement that employers integrate (consideration of conditions of maintenance" into their electrical safety plan, and addressing that requirement with a formal EPM based on the recommendations of NFPA 70B would be a good way to do so.

5.6 Record Power Meter Data Annually and Reset Meter Fields

Power meters are important instruments for monitoring the performance of an industrial process and the suitability and capacity of distribution equipment. This historical data is critical to determining the available capacity when adding loads to buses, protective equipment, and feeder circuits Power quality data such as power factor and harmonic distortion of currents and voltages, is also important is assessing the impact of additions to the power system. For the power demand, consumption, and power quality data to be used for assessing the capacity of a power system it must be historized as required by Article 220.88 (1) of the National Electrical Code.

As a minimum SEWRF should transfer or record power demand data, that is time and date stamped from all power meters on the switchgear and MCCs on a monthly basis. Once the data is gathered, the plant should reset the demand register of the meters. Historical maximums after the reset will then provide a basic power demand profile. This information provides SEWRF's operators, managers, engineers, and consultants with better data of recent and historical operating conditions. SEWRF’s equipment installed before 2000 do not have digital, historical meters, but most of the more recent MCCs do (MCCs -1A and -2A do not, and the recently installed MCCs -1B and -2B have not been verified). Where possible the power demand, power factor, and harmonic information should be automatically input into the plant SCADA system, and thereby create a database of electrical power information. As new electrical equipment is added and existing equipment replaced this equipment should be specified with metering that is linked into the plant SCADA system and historized; thereby eliminating the need for staff to manually perform this task.

5.7 Establish a Procedure for taking an Annual Energy Baseline

Energy performance for a wastewater treatment plant, the energy consumed to treat a unit of raw water influent, is a valuable metric for monitoring the effectiveness of a treatment processes. Trends in energy consumption provide insight into the impact of project and provide guidance in evaluating capital investments. The process of evaluating energy performance begins with establishing an energy baseline, and that baseline requires data.

Carollo has begun the work of establishing an energy baseline for the plant by using a spreadsheet tool, developed for this purpose by the U.S. Environmental Protection Agency, called the Energy Usage Assessment Tool (EUAT). Five years of data from electricity bills, as well as the monthly treated volumes during this time, have been entered as a start at creating a baseline for the plant. Carollo can provide the County with this spreadsheet (a file developed in Microsoft Excel) for its use in the future, but at the time of writing, this effort is incomplete because some of the data is unavailable. The remaining data fields required to establish the energy baseline are the operating hours per year of the plant's major equipment, in addition to the average motor current when the loads run. The operating hours is data that can either be mined from the SCADA system historian server or estimated by plant operators. Average motor current will have to be measured manually while the load runs, until the plant acquires Smart MCCs that automatically collect this data.

Carollo recommends that the County develop a procedure for collecting average motor operating current and operating hours per year for all continuous process equipment. This could be facilitated by investing in a recording power meter that is available as a hand tool with clamp on CTs (current transformers), which are typically less than ~ $4000; however, MCU will need to establish and enforce an ESP and provide the proper Personal Protective Equipment (PPE) in order to accomplish this task in accordance with NFPA 70E. Then, using the EPA's EUAT, the MCU can establish 2018 as a "baseline year" for energy consumption. This tool then allows staff to assess the energy performance of future process improvements and observe trends in plant-wide energy consumption not seen in utility bills, process instrumentation, or live SCADA data.

6.0 SHORT TERM IMPROVEMENTS

Carollo recommends the following short-term improvements to secure basic equipment functionality and identify other concerns that may not have been identified during this study.

6.1 General Maintenance Tasks to Secure Basic Equipment Functionality

Repair or replace failed indicator lights and annunciator lights on all four switchgear assemblies.

Repair or replace failed power meter on SWGR-2B (a replacement part has been ordered at the time of writing).

Staff reported problems with circuit breakers failing to operate at the SEWRF. The recommended short term action is to exercise the breakers by opening and closing them. Further, the SEWRF should inspect and test all of its circuit breakers in accordance with ANSI/NETA Maintenance Testing Standards and correct any issues that are found. Prioritize power circuits breakers and large molded case circuit breakers (50 A and above) over small molded case circuit breakers (less than 50 A). Maintenance of motor circuit protectors should be performed with preventive maintenance on motor control equipment.

Replace the remaining power conductors to basin loads from the original construction: Aerator 1A, Aerator 1B, Aerator 1C, Aerator 2C, Anoxic Mixer 1A, Anoxic Mixer 1B, Anoxic Mixer 2A, and Anoxic Mixer 2B. Branch circuits from MCC-2 to Aerator 2A and 2B have already failed, and classified locations like an aeration basin are known to be hazardous and corrosive.

Perform a Megger test on the insulation of 30-year-old underground cables, with feeder circuits and critical equipment at the highest priority for testing. Carollo has found underground cable to be a common source of failure at wastewater treatment plants, particularly where flooding and lightning are common.

Where motor circuit protectors (MCP) are used to protect feeder circuits, replace the MCPs with molded case circuit breakers (MCCB). This installation method was used in several instances for feeder circuits to VFDs installed external to their MCC source. It's a violation of the National Electrical Code (NEC) Article 430.52 and should be corrected.

6.2 Studies and Maintenance to Remedy Power Quality Problems

Perform a harmonic study in accordance with ANSI/NETA MTS Section 6.6 and ANSI/IEEE Standard 399. Plant staff reported random circuit breaker trips throughout the system, suggesting sporadic instances of high heat at the overcurrent protective devices. This is typical of high line currents caused by a low power factor, which was observed at all motor control centers, and high harmonic currents, which was observed at MCC-11 and MCC-12.

Inspect and test the plant's grounding systems in accordance with ANSI/NETA MTS Section 7.13 and all surge arrestors in accordance with ANSI/NETA MTS Section 7.19. This recommendation is to account for corrosion problems endemic to coastal environments like

Manatee County, the high incidence of lightning strikes, the frequency of utility outages, and the observed power harmonic problems at the facility.

Replace or install power factor correction capacitors (PFCC) or line reactors for the following equipment:

- In all cases, confirm that contactors are working correctly to avoid making harmonic issues worse. PFCCs should not be left on-line when the motor with which they are associated is off-line.
- PFCCs for the nine 125 HP aerators and two 125 HP sludge blowers that are supplied by MCCs 1, 2, 3, and 4.
- PFCCs for the starters of the three 250 HP sludge blowers supplied by MCCs 7 and 8.
- Line reactors for VFDs to the 75 HP RAS Pumps and 7.5 HP WAS Pumps that are supplied by MCCs 11 and 12.
- Line reactors for VFDs to the 10 HP Sludge Feed Pumps and Gravity Belt Discharge Pumps that are supplied by MCCs 7 and 8.

Table 6.1 Probable Construction Cost - Short Term Improvements in 2019

No.	Description	Total
1	Replace MCPs with MCCBs	$8,000
2	Replace branch circuits to four aerators & four anoxic mixers	$10,000
3	Replace power meter on SWGR-2B (in-progress)	
3	Provide power meter on each new MCC	see MCC replacements 2019
4	Maintenance testing of ground system, underground cable, and harmonic study	$20,000
5	Protection study	$15,000
6	Replace power factor correction capacitors	$40,000
7	Provide line reactors for VFDs on RAS & WAS Pumps.	see RAS/WAS Rehab 2018
8	Provide line reactors for VFDs on Sludge Feed and Gravity Belt Discharge Pumps.	see Arc Flash Mitigation 2019
9	Provide line reactors for VFD-305, VFD-307, and VFD-308.	$6,000
	TOTAL DIRECT COST(1)(2)	**$99,000**
	Contingency (50%)	$49,500
	Subtotal	**$148,500**
	Sales Tax (7%)	$10,395
	TOTAL PROJECT COST(3)(4) (5)	**$159,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).

(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.0 RECOMMENDED ELECTRICAL PROJECTS (W/ COST ESTIMATE)

The projects described in this summary of CIPs are organized so that installation work is grouped together where possible to reduce management, administrative costs, and disruptions to operations - but in some instances, work that could be performed concurrently is split into two (or more) projects to provide flexibility to the County as it prioritizes it's expenditures. The 'opinions of probable construction cost' can be used in budget projections, and the project descriptions can be used to scope Requests for Proposals (RFPs) from design consultants.

7.1 Replacements with RAS/WAS System Rehabilitation in 2018

The following list details projects recommended to take place in 2018:

- Replace the VFDs for all three RAS pumps and four WAS pumps with the "RAS and WAS System Rehabilitation" project. VFDs typically last 9-20 years, and these were installed in 2000. For VFDs larger than 50 HP, use 18-pulse technology to mitigate potential damage from voltage surges upstream and prevent power quality problems at MCC-11 and MCC-12.. For VFDs less than or equal to 50 HP, use 6-pulse technology, and potentially active harmonic filters depending on the ratio of large to small VFDs and the available short circuit current at the source. With the long distance from VFD to the RAS and WAS pumps (~600 feet), load reactors or similar filtering on the output side of the VFD should be provided. Carollo recommends contacting the manufacturer to determine what mitigation techniques need to be used in order to address dv/dt and reflect wave problems on these load circuits. When the existing cables are replaced, Carollo recommends providing shielded VFD cables to protect against high carrier frequencies and the potential for corona discharge.

- Replace MCC-9 and MCC-10. Both are 30 years old, have an inadequate short circuit rating for the application, and have had instances when circuit breakers failed to open on short circuits.

- Evaluation of the control system is outside the scope of the EMP, however consideration should be given to replacing the SCADA Panel SP-1, which serves MCC-9, MCC-10, and all other motor control centers in the electrical building. SP-1 uses Rockwell Automation's SLC 5/05 line PLCs. The SLC5/05 is a discontinued and unsupported platform that is no longer manufactured, does not receive firmware updates, is becoming difficult to replace when failures occur, and is vulnerable to IT security invasions. By replacing SP-1 at the same time as the MCCs, SEWRF will pay for PLC programming only once. If they are done as separate projects, SEWRF would pay twice for PLC programming. If SEWRF selects smart MCCs (as Carollo recommends), then the cost of adding the new technology could be reduced or eliminated because smart MCCs use networked I/O rather than hard-wired I/O, avoiding installing and terminating hundreds of wires between both enclosures. The cost does not include the reprogramming costs need for the new PLC platform.

- Replace the panelboards and transfer switches built between 1988 and 1989 and fed from MCCs 9 and 10. (MTS #3, Panel P1, MTS #4, Panel LE, Sub-Panel LE, Panel PFC, Panel LFC, Panel PC/TC-1.)

- Remove Flocculator 1 Panel, Flocculator 2 Panel, and Flocculator Control Panel, they are no longer used and in general any equipment that is no longer in-use should be demolished.

Table 7.1 Probable Construction Cost - Replace VFDs for RAS/WAS Pumps in 2018

No.	Description	Total
1	Three new "engineered drive package" in separately-mounted NEMA 1 enclosure for RAS Pumps (480V, 75 HP, 18-pulse)	$135,000
2	Three new "engineered drive package" in separately-mounted NEMA 1 enclosure for WAS Pumps (480V, 6-pulse, 7.5 HP, line reactor, load reactor)	$60,000
3	Demo 12 vertical sections from 2 MCCs	$5,000
4	Replace with 6 vertical sections in 2 smart MCCs	$105,000
5	Replace SP-1 with a new PCM (CompactLogix PLC system, 6 cards of I/O, network connections to MCC). Programming cost not included.	$100,000
6	Replace 2 manual transfer switches (150A), and 6 panelboards (150A).	$40,000
6	Wiring and conduits	$30,000
	TOTAL DIRECT COST(1)(2)	**$475,000**
	Contingency (50%)	$237,500
	Subtotal	**$712,500**
	Sales Tax (7%)	$49,875
	TOTAL PROJECT COST(3)(4) (5)	**$763,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.2 Dedicated Plant Drain Station in 2018

For this project, two drain stations will be added and one drain station will be improved.

The new drain station at the biosolids dryer will need a local control panel (LCP) to house the two starters for the drain station pumps, a feeder circuit, two branch circuits from LCP to pumps, and all associated control wiring. The pumps are both assumed to be 25 HP, so the starters will be size 2 FVNR, and the conductors will be sized to match the load. The LCP will be fed from a

feeder circuit breaker in MCC-1BSD in the biosolids dryer building, and the LCP will be controlled by the PLC cabinet.

The new lift station at the septage receiving facilities is assumed to have one 10 HP pump, an LCP with a size 1 FVNR, power conductors for the branch and feeder circuits (sourced from MCC-SEP), and control conductors back to the septage receiving station PLC. This facility might qualify as a Classified Area by NFPA 820 - and if so the appropriate design requirements will have to be addressed.

The existing South Plant Drain Pump Station will be upgraded with three new 40-HP pumps replacing the three existing 25-HP pumps. A new LCP (three size 3 FVNR starters) will replace the existing LCP. The existing feeder circuit breaker at MCC-12 will be upgraded. Power and control conductors will be replaced.

Table 7.2 Probable Construction Cost - Dedicated Plant Drain Station in 2018

No.	Description	Total
1	Duplex local control panel with size 2 FVNR starters and integral disconnect in NEMA 4X enclosure.	$20,000
2	Feeder circuit: 100' of 3#4(PH) & 1#6(G) in a 2" PVC-80	$3,000
3	Branch circuits: 40' of 3#8(PH) & 1#8(G) in a 3/4" GRC	$1,500
4	Local control panel with one size 1 FVNR starter and integral disconnect in NEMA 4X enclosure.	$2,000
5	Feeder & branch circuits: 50' of 3#10(PH) & 1#10(G) in a 2" PVC-80	$1,000
6	Replace existing triplex local control panel with new: size 3 FVNR starters and integral disconnect in NEMA 4X enclosure.	$15,000
7	Feeder circuit: 200' of 3#3/0(PH) & 1#3(G) in existing conduit	$5,000
8	Branch circuits: 60' of 3#6(PH) & 1#6(G) in existing conduit	$2,500
9	Miscellaneous wiring and conduits	$5,000
	TOTAL DIRECT COST(1)(2)	**$55,000**
	Contingency (50%)	$27,500
	Subtotal	**$82,500**
	Sales Tax (7%)	$5,775
	TOTAL PROJECT COST(3)(4)(5)	**$89,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.3 Replace SWGR-1A/B and Generator Switchboards 1/2 & 2/3, in 2019

The following list details projects recommended to take place in 2019:

- Replace SWGR-1A/B with new switchgear, including new main circuit breakers with digital meters, new feeders to supply SWGR-2A/B (see drawing 03E26, Appendix A), new battery charger, and new batteries for control power.

- Replace Generators 1&2 Switchgear and Generators 2&3 Switchgear with SWGR-GEN at the same time as SWGR-1A/B. The replacement switchgear should be capable of paralleling Generator 1 and Generator 2 - and the County might wish to have Generator 3 as well, though without the ability to parallel with the other units (because of mis-matched winding pitch, as mentioned above). SWGR-GEN will connect to the distribution system at the transfer bus between two tie circuit breakers in the new SWGR-1A/T/B assembly (see drawing EMP-2019, Appendix C).

- Rearrange the service feeders from the FP&L transformers into the plant, dedicating one FP&L transformer to each bus of SWGR-1A/B, with SWGR-2A/B receiving its supply from SWGR-1A/B rather than directly from FP&L. One option that the plant might consider is to ask FP&L for larger transformers so that one of them could carry the load of the entire plant - in case the other transformer fails. However, this option might lead FP&L to charge the plant at a different rate to recover the cost of this service.

- An unknown variable that could impact this work is the integration of the Co-Gen with the main circuit breaker of bus SWGR-2A, which must be closed for the Co-Gen system to operate (the Co-Gen system must be grid-connected). If it's necessary to migrate that connection point to SWGR-1A/T/B, then cost would be associated with that change as well. Integration of Co-Gen is outside the scope of this study.

Table 7.3 Probable Construction Cost – Replace SWGR-1A/B, Gen Swgr in 2019

No.	Description	Total
1	Temporary power to keep existing process equipment in operation	$30,000
2	Remove SWGR-1A/B (480V, 4000A)	$4,000
3	Remove Generators 1&2 Switchgear (480V, 4000A)	$4,000
4	Remove Generators 2&3 Switchgear (480V, 4000A)	$4,000
5	Replace with new SWGR-1A/B (480V, arc-resistant low voltage switchgear, 4000A, 3-bus, nine vertical sections)	$510,000
6	Replace with new Generator Switchgear (480V, 4000A)	$200,000
7	Replace battery charger and batteries (48V, 12ADC)	$25,000
8	Miscellaneous wiring and conduits	$50,000
9	Building allowance	$50,000
	TOTAL DIRECT COST(1)(2)	**$877,000**
	Contingency (50%)	$438,500
	Subtotal	$1,315,500
	Sales Tax (7%)	$92,085
	TOTAL PROJECT COST(3)(4)(5)	**$1,408,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).

(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.4 Replace MCC-5 and MCC-6 (and Arc Flash Mitigation) in 2019

The following list details projects recommended to take place in 2019:

- Replace MCC-5 and MCC-6. They're old amd missing parts.
- Replace the SCADA Panel (SP-4) because it controls MCC-5 and MCC-6. The PLC equipment in SP-4 is all Rockwell Automation's SLC 5/05 line, and the benefits of replacing it with the MCCs they serve are discussed above.
- Replace the VFDs installed in 2000 for the sludge pumps: VFD-301, VFD-302, VFD-303, VFD-304, and VFD-306. VFDs typically last 9-20 years, and these are near the end of their service life. When replacing them, provide a line reactor on the drive input to mitigate the potential damage from voltage surges upstream, and mitigate power quality problems at their sources, MCC-7 and MCC-8.
- Replace the panelboards and manual transfer switches installed between 1988 and 1989: MTS-LD, Panel LD, MTS-LHW, Panel-LHW, and Panel PC/TC.
- Install a new service entrance circuit breaker (1600 A) between the FP&L transformer and MCC-1BSD (at the biosolids dryer) to reduce fault clearing time at MCC-1BSD. This will lower the arc flash hazard on that motor control center.
- Rehabilitate the SEWRF's equipment tagging system. See Section 5.2 of Operational Improvements.
- Update safety labeling with a plant-wide arc flash evaluation. The SEWRF's last arc flash evaluation was in 2015. NFPA 70E requires that an arc flash hazard analysis be reviewed every five years or when significant changes are made to the system. Thus, the MCU should have a new arc flash evaluation under this project, put updated labels on all its equipment, and train its staff to use the equipment in accordance with its Electrical Safety Plan (ESP). Responsibilities should be assigned as recommended in the ESP and Job Hazard Analysis procedures for common tasks written in the ESP.

Table 7.4 Probable Construction Cost - Replacement of MCC 5 & MCC 6, 2019

No.	Description	Total
1	Demo 12 vertical sections from 4 MCCs	$5,000

2	Demo panelboard, transfer switch, SP-4	$4,000
3	Replace with 10 vertical sections in 2 Smart MCCs	$177,000
4	Replace SP-4 with a new PCM (CompactLogix PLC system, 6 cards of I/O, network connections to MCC). Programming cost not included.	$50,000
5	Five new separately-mounted VFDs in NEMA 1 enclosure for sludge pumps (480V, 6-pulse, 10 HP, line reactor and load reactor)	$53,000
6	Replace 2 manual transfer switches (150A), 3 panelboards (150A).	$28,000
7	New service entrance circuit breaker for MCC 1BSD (480V, 3PH, 1600A)	$38,000
8	Update equipment tagging across the site and in one-line drawings.	$30,000
9	Arc flash study.	$20,000
10	Miscellaneous wiring and conduits.	$20,000
	TOTAL DIRECT COST(1)(2)	**$425,000**
	Contingency (50%)	$212,500
	Subtotal	**$637,500**
	Sales Tax (7%)	$44,625
	TOTAL PROJECT COST(3)(4)(5)	**$683,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.5 Anoxic Basins Mixer Replacements, 2020

Carollo recommends replacing the anoxic mixers in basins 1, 2, and 3, with possible changes to the aerators, as well. Both new surface aerators and fine bubble diffusion are being considered, and the electrical requirements for installing that equipment would depend on which solution is selected. This estimate focus only on the mixers replacement already planned:

The following list details projects recommended to take place in 2020:

- Replace existing conductors, exposed conduit, and disconnect switches for aerators and mixers. Aeration basins are known for being corrosive and hazardous environments, and branch circuits to Aerator 2A and 2B have already failed at the SEWRF. The plant should replace them under this project. There is also a substantial risk that conduits that have been buried for a long time are filled with sand and not re-usable. If that is the case, then the underground conduit will have to be replaced and the cost will increase accordingly.

- Remove the VFDs for the RML pumps, which are also being removed.

Table 7.5 Probable Construction Cost - Anoxic/Aeration Upgrades, 2020

No.	Description	Total
1	Replace conductors in existing conduit 3200 feet of 3-#10 (PH) & 1-#10 (G) for all 6 anoxic mixers.	$87,000
2	Replace 6 60A, N4X disconnect switches for anoxic mixers.	$30,000
3	Replace conductors in existing conduit 1300 feet of 6-#3/0 (PH) & 1-#4 (G) for 4 aerators (1A, 1B, 3A, 3B).	$56,000
4	Replace 6 250A, N4X disconnect switches for aerators.	$71,000
5	Demo 4 30-HP VFDs for the RML pumps.	$4,000
	TOTAL DIRECT COST	**$248,000**
	Contingency (50%)	$124,000
	Subtotal	**$372,000**
	Sales Tax (7%)	$26,000
	TOTAL PROJECT COST(3)(4)	**$399,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.6 Flow Equalization Tanks and Mixed Liquor Splitter Box Rehab in 2021

The following list details projects recommended to take place in 2021:

- Replace existing conductors and control panels for five submersible pumps.
- Upgrade existing lighting to LEDs.

Table 7.6 Probable Construction Cost - Flow Equalization Tanks Rehab, 2021		
No.	**Description**	**Total**
	Replace conductors for 2 30-HP submersible pumps in existing conduit: 400 feet of 3-#8 (PH) & 1-#8 (G).	$8,000
	Replace conductors for 3 10-HP submersible pumps in existing conduit: 750 feet of 3-#12 (PH) & 1-#12 (G).	$8,000
	Replace local control panel for 5 submersible pumps (HOA with Start and Stop pushbuttons).	$3,000
	Replace existing lighting with LED. Assume 30 exterior pole-mounted lights on tanks and basins.	$38,000
	New conductors in existing conduit for LED lights. Assume 2,000' of 3-#12 (PH) & 1-#12 (G).	$11,000
	TOTAL DIRECT COST	**$68,000**
	Contingency (25%)	$34,000
	Subtotal	**$102,000**
	Sales Tax (7%)	$7,140
	TOTAL PROJECT COST(3)(4)	**$110,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.7 Replace BFP Control Panels with Belt Filter Press Upgrades, 2022

The following list details projects recommended to take place in 2022:

- Replace the existing BFP control panels, since they are all 30 years old and in terrible condition.

Table 7.7 Probable Construction Cost - Replacement of BFP Control Panels, 2022

No.	Description	Total
1	Replace 3 control panels for existing belt filter presses	$225,000
2	Miscellaneous wiring and conduits	$20,000
	TOTAL DIRECT COST(1)(2)	**$245,000**
	Contingency (50%)	$122,500
	Subtotal	**$367,500**
	Sales Tax (7%)	$25,725
	TOTAL PROJECT COST(3)(4)	**$394,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.8 Secondary Clarifiers Rehabilitation, 2022

The following list details projects recommended to take place in 2022:

- Replace the disconnect switch and control panel for Clarifiers 1 and 2. They appear to be the original equipment installed in 1989.
- Update arc flash study and labeling.

Table 7.8 Probable Construction Cost - Secondary Clarifiers Rehabilitation in 2022

No.	Description	Total
1	Demolition	$1,000
2	Replace 2 60A, N4X disconnect switches	$10,000
3	Replace 2 LCPs (separately mounted non-combo motor starters: 1 HP, FVNR1)	$7,000
4	Miscellaneous wiring and conduits for retrofit transitions	$2,000
5	Arc flash study	$20,000
	TOTAL DIRECT COST(1)(2)	**$40,000**
	Contingency (50%)	$20,000
	Subtotal	**$60,000**
	Sales Tax (7%)	$4,200
	TOTAL PROJECT COST(3)(4)	**$65,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.9 New MCC and Electrical Building for Anoxic/Aeration Basin #4 in 2026

The following list details the electrical portion of this project in 2026:

- 40' x 20' building with HVAC equipment.
- Eight vertical sections of new motor control center.
- One PLC cabinet.
- Two panelboards.
- New conductors and conduit in ductbank for mixers and aerators.

Table 7.9 Probable Construction Cost - Anoxic/Aeration Basin #4 in 2026

No.	Description	Total
1	New electrical building with HVAC (40' x 20' @ 250 $/sqft)	$200,000
2	New MCC 8 vertical sections	$138,000
3	New PLC cabinet	$50,000
4	New 2 panelboards (150 A)	$8,000
5	New conductors and conduit: 1200 feet of 3-#10 (PH) & 1-#10 (G) for 2 anoxic mixers.	$33,000
6	New 60A, N4X disconnect switches for 2 anoxic mixers	$10,000
7	New conductors and conduit: 700 feet of 6-#3/0 (PH) & 1-#4 (G) for 2 aerators (4A, 4B)	$20,000
8	New 250 A N4X disconnect switches for 2 aerators	$24,000
	TOTAL DIRECT COST	**$483,000**
	Contingency (50%)	$241,500
	Subtotal	**$724,500**
	Sales Tax (7%)	$50,715
	TOTAL PROJECT COST(3)(4)	**$776,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.10 Electrical System Upgrades in 2030

Many electrical components were installed in 2000, bringing them to the end of their 30-year service life in 2030 and 2031. The most significant component is SWGR-2A/B, the distribution source for nine motor control centers, one high service pump, and the connection point for the co-generation switchgear. The role of SWGR-2A/B will have changed in 2019, eliminating both its direct service connections from the FP&L transformer and its direct connections to Generators 2&3 Switchgear; it will have become a downstream distribution bus for SWGR-1A/B.

The design of the 2019 project will allocate space to accommodate the 2030 upgrades. Consolidating switchgear for Generators 1 & 2 and Generators 2 & 3 in the space that's presently occupied Generators 2&3 Switchgear (and the walking space next to it) would leave room for SWGR-1A/B to grow in either direction as it added additional vertical sections.

- The following list details projects recommended to take place in 2022:Replace MCC-1, MCC-1A, MCC-2, MCC-2A, MCC-3, MCC-4, MCC-7, MCC-8, MCC-11, and MCC-12, providing new conductors in existing conduit when possible from SWGR-1A/B. When replacing MCC-1 and MCC-2, reduce equipment, footprint, and overall cost by consolidating MCC-1 and MCC-1A into one line-up and MCC-2 and MCC- 2A into one line-up. This should include some (or all) of the space- and cost-saving measures recommended above for the project in 2026. Replacement of MCC-1, -1A, -2, -2A, -3, and -4 could be moved up to 2026, as explained above in Section 2.12.

- Replace the SCADA Panel SP-2, which serves MCC-1, MCC-1A, MCC-2, MCC-2A, MCC-3, and MCC-4. This recommendation is based on the electrical criteria discussed in this master plan - and the benefits of replacing PLC equipment at the same time as the motor control center it controls. SCADA system considerations are absent here, and a quicker replacement might be warranted based on those criteria. That is beyond the scope of this study.

- Replace the SCADA Panel SP-3 (which serves MCC-7 and MCC-8). This recommendation is based on the electrical criteria discussed in this master plan - and the benefits of replacing PLC equipment at the same time as the motor control center it controls. SCADA system considerations are absent here, and a quicker replacement might be warranted based on those criteria. That is beyond the scope of this study.

- Replace the panelboards and manual transfer switches that were built between 1988 and 1989 (MTS-L1, Panel L1, Panel-P4, Panel L4, Panel LDA, Panel L2, MTS-L2, Panel L3, MTS-L3, Panel PC/TC-3). Also replace the three control panels for sludge blowers 1, 2, and 3 in the sludge building,and the disconnect switches for the air compressor and air scour blowers in the Air Scour Blower Building - and for the equalization blowers in the Headworks Electrical Building.

- Replace the co-generation circuit breaker with a new unit that connects to SWGR-1A/B. An estimate of this work is outside the scope of this project.

- Update arc flash study and labeling.

Table 7.10 Probable Construction Cost – Electrical System Upgrades in 2030		
No.	**Description**	**Total**
1	Add 6 new vertical sections with power circuit breakers to existing SWGR-1A/B (480V, arc-resistant low voltage switchgear, 4000A, 3-bus, 9 vertical sections)	$150,000
2	Demo 20 vertical sections from 4 MCCs (MCC-1, -1A, -2, -2A)	$8,000
3	Replace with 20 new vertical sections in 2 MCCs (MCC-1, -2)	$344,000
4	Demo 13 vertical sections from 2 MCCs (MCC-3, -4)	$5,200
5	Replace with 13 new vertical sections in 2 MCCs (MCC-3, -4)	$223,600
6	Demo 10 vertical sections from 2 MCCs (MCC-7, -8)	$8,000
7	Replace with 10 new vertical sections in MCCs (MCC-7, -8)	$344,000
8	Demo 9 vertical sections from 2 MCCs (MCC-11, -12)	$3,600
9	Replace with 9 new vertical sections in 2 MCCs (MCC-11, -12)	$155,000
10	Replace SP-2 with a new PCM (using a PLC platform that's appropriate for the plant and market conditions of 2035).	$50,000
11	Replace 7 panelboards (150A) & 3 manual transfer switches (150A),	$60,000
12	Replace 1 60A disconnect switch, 2 250A disconnect switches, and 3 400A disconnect switches,	$20,000
13	Replace 3 local control panels for sludge blowers.	$20,000
14	Temporary power to keep existing process equipment in operation.	$20,000
15	Remove SWGR-2A/B (480V, 4000A)	$4,000
16	Conduit and conductor to extend feeder circuits to SWGR-1A/B from the space formerly occupied by SWGR-2A/B.	$30,000
17	Building improvement allowance.	$50,000
18	Arc flash study.	$20,000
	TOTAL DIRECT COST	**$1,522,400**
	Contingency (50%)	$761,200
	Subtotal	**$2,283,600**
	Sales Tax (7%)	$159,852
	TOTAL PROJECT COST(3)(4)	**$2,444,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.11 VFD Replacements for Sludge Pumps in 2033

The following list details projects recommended to take place in 2033:

- Replace VFDs installed in 2013 for the sludge pumps: VFD-305, VFD-307, and VFD-308. Carollo expects these last 20 years and will reach the end of service life in 2033. When replacing them, provide a line reactor on the drive input to mitigate the potential damage from voltage surges upstream and mitigate power quality problems from at their sources, MCC-7 and MCC-8.
- Update arc flash study and labeling.

Table 7.11 Probable Construction Cost - VFD Replacements in 2033

No.	Description	Total
1	Three new separately-mounted VFDs in NEMA 1 enclosure for sludge pumps (480V, 6-pulse, 10 HP, line reactor, and load reactor).	$31,000
2	Arc flash study.	$20,000
3	Miscellaneous wiring and conduits.	$5,000
	TOTAL DIRECT COST(1)(2)	**$56,000**
	Contingency (25%)	$28,000
	Subtotal	**$84,000**
	Sales Tax (7%)	$5,880
	TOTAL PROJECT COST(3)(4)	**$90,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.12 MARS Equipment Replacements in 2035

The following list details projects recommended to take place in 2035:

- Replace the five 100-HP VFDs for the MARS low service pumps. When replacing these, Carollo recommends using technology that mitigates the potential damage from voltage surges upstream and power quality problems at their sources. In 2018, we typically recommend 18-pulse drives for drives above 50 HP, but the technology that's available in 2035 should dictate the solution. Cost estimates below assume 18-pulse technology.
- Replace the two 200 HP VFDs with MARS high service jockey pumps.
- Replace the four 400 HP VFDs with MARS high service pumps.
- Replace the SCADA Panel SP-6 (for the MARS system). This recommendation is based on the electrical criteria discussed in this master plan - and the benefits of replacing PLC equipment at the same time as the motor control center it controls. SCADA system considerations are absent here, and a quicker replacement might be warranted based on those criteria. That is beyond the scope of this study.
- Update arc flash study and labeling.

Table 7.12 Probable Construction Cost - MARS Equipment Replacements in 2035

No.	Description	Total
1	Replace 5 separately-mounted VFDs in NEMA 1 enclosure with low service pumps (480V, 18-pulse 100 HP).	$190,000
2	Replace 2 separately-mounted VFDs in NEMA 1 enclosure with high service jockey pumps (480V, 18-pulse 200 HP).	$120,000
3	Replace 4 separately-mounted VFDs in NEMA 1 enclosure with high service jockey pumps (480V, 18-pulse 400 HP).	$393,000
4	Replace SP-6 with a new PCM, using a PLC platform appropriate for the plant and market conditions of 2035.	$50,000
5	Arc flash study.	$20,000
6	Miscellaneous wiring and conduits.	$20,000
	TOTAL DIRECT COST(1)(2)	**$793,000**
	Contingency (50%)	$396,500
	Subtotal	**$1,189,500**
	Sales Tax (7%)	$83,265
	TOTAL PROJECT COST(3)(4)	**$1,273,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.13 Replace Generator 1 in 2035

The following list details projects recommended to take place in 2035:

- Replace Generator 1, which will be 40 years old in 2035.
- Update arc flash study and labeling.

Table 7.13 Probable Construction Cost - Replace Generator 1, 2025

No.	Description	Total
1	Remove existing Generator 1	$14,000
2	Install new Generator 1 (480V, Standby, 2000 kW, 0.8 pf)	$1,076,000
3	New conductors in existing conduit	$32,000
4	Arc flash study	$20,000
	TOTAL DIRECT COST(1)(2)	**$1,142,000**
	Contingency (50%)	$571,000
	Subtotal	**$1,713,000**
	Sales Tax (7%)	$119,910
	TOTAL PROJECT COST(3)(4)	**$1,833,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.14 Biosolids Equipment Replacements in 2038

The following list details projects recommended to take place in 2038:

- Replace the MCC-1BSD with integral biosolids PLC section.
- Replace XFMR-UPS, Panel-UPS, XFMR-LIGHT, Panel LP-1.
- SP-1 will be replaced in 2018 and will be ready for replacement again in 20 years.
- SP-4 will be replaced in 2019 and will be ready for replacement again in 20 years.
- Update arc flash study and labeling.

Table 7.14 Probable Construction Cost - Biosolids Equipment Replacements in 2038

No.	Description	Total
1	Demo 15 vertical sections MCC-1BSD with integral PLC section.	$6,000
3	Replace with new 15 vertical section Smart MCCs with integral PLC section.	$258,000
5	Replace one transformer (7kVA) & two panelboards (150A).	$10,000
4	Replace SP-1 with a new PCM (using a PLC platform that's appropriate for the plant and market conditions of 2038).	$50,000
5	Arc flash study.	$20,000
6	Miscellaneous wiring and conduits.	$20,000
	TOTAL DIRECT COST(1)(2)(3)	**$367,000**
	Contingency (25%)	$182,000
	Subtotal	**$546,000**
	Sales Tax (7%)	$38,220
	TOTAL PROJECT COST	**$585,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.15 Replace Generator 2 in 2045

The following list details projects recommended to take place in 2045:

- Replace Generator 2, which will be 50 years old in 2045.
- Update arc flash study and labeling.

Table 7.12 Probable Construction Cost - Replace Generator 2, 2033

No.	Description	Total
1	Remove existing Generator 2	$14,000
2	Install new Generator 2 (480V, Standby, 2000 kW, 0.8 pf)	$1,076,000
3	New conductors in existing conduit	$32,000
4	Arc flash study	$20,000
	TOTAL DIRECT COST(1)(2)	**$1,142,000**
	$571,000	$571,000
	Subtotal	**$1,713,000**
	$119,910	$83,265
	TOTAL PROJECT COST(3)(4)	**$1,833,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

7.16 Electrical Equipment Replacements in 2045

The following list details projects recommended to take place in 2045:

- Eliminate MCC-13 and MCC-14, which house the feeder circuit breakers to externally-mounted VFDs for the MARS system. No motor control is provided in either of these assemblies; they transfer these loads only to SWGR-1A/B (preferred) or one of the motor control centers that are fed by it (MCC-9, -10, -11, or -12).
- Replace Panel PC/TC-2.
- Replace MCC-SEP.
- SP-2 will be replaced in 2022 and will be ready for replacement again after 20 years.
- Update arc flash study and labeling.

Table 7.16 Probable Construction Cost - Electrical Equipment Replacements in 2045

No.	Description	Total
1	Demo 6 vertical sections from 2 MCCs (MCC-13 and MCC-14).	$2,500
2	Replace with 4 new vertical sections, retrofit to existing MCCs: 2 each added to MCC-9, -10.	$65,000
3	Demo 6 vertical sections from MCC-SEP	$2,500
4	Replace 1 panelboard (150A)	$4,200
	Replace with 6 existing sections with new MCC-SEP	$104,000
6	Replace SP-3 with a new PCM, using a PLC platform appropriate for the plant and market conditions of 2045.	$50,000
7	Arc flash study.	$20,000
8	Miscellaneous wiring and conduits.	$10,000
	TOTAL DIRECT COST(1)(2)(3)	**$258,200**
	Contingency (25%)	$129,100
	Subtotal	**$387,300**
	Sales Tax (7%)	$27,111
	TOTAL PROJECT COST	**$415,000**

Notes:
(1) Includes material, labor, general expenses, equipment, overhead (10%), and profit (5%).
(2) Market escalators for local labor and material are used in the cost estimating program. Material is 96.6% of the national average, and labor is 64% of the national average.
(3) Does not include engineering, bonds, permit, and Owner's reserve for change orders.
(4) Rounded up to the next thousand.
(5) Class 5 estimate with 50% contingency.

ELECTRICAL PLAN SYMBOLS

IDENTIFICATION SYMBOLS

EQUIP # — EQUIPMENT AND INSTRUMENT IDENTIFICATION

EQUIPMENT/INSTRUMENT LOCATOR

LUMINAIRE IDENTIFICATION
a = CIRCUIT DESIGNATION
b = DEVICE SWITCHED FROM
c = MOUNTING HEIGHT IN FEET TO BOTTOM OF FIXTURE

XXXX — CONDUIT IDENTIFICATION
XXXX = CONDUIT NUMBER,
REFER TO CONDUIT SCHEDULE
UNLESS OTHERWISE NOTED, GROUPED CONDUITS ARE LABELED LEFT TO RIGHT OR TOP TO BOTTOM.

X — INDICATES KEYNOTE X
(PERTAINS ONLY TO SHEET WHERE NOTE IS FOUND)

A — DISCONNECT SWITCH
A = TYPE, REFER TO DISCONNECT SCHEDULE

LUMINAIRES

LINEAR FIXTURE

2' X 2' LAY-IN TROFFER

2' X 4' LAY-IN TROFFER

LUMINAIRE POLE MOUNTED

R H — GO/NO-GO PANEL - STROBE AND HORN
R = RED LIGHT
G = GREEN LIGHT
H = HORN

R G — GO/NO-GO PANEL - SOLID

R — GO/NO-GO PANEL - STROBE

LUMINAIRE, EMERGENCY BATTERY-POWERED

LUMINAIRE, EMERGENCY/EXIT BATTERY-POWERED

LUMINAIRE, EMERGENCY BATTERY-POWERED REMOTE

LUMINAIRE, SURFACE OR PENDANT MOUNTED

LUMINAIRE, WALL MOUNTED

LUMINAIRE, FLOOD/SPOT

LUMINAIRE, EXIT ONE OR TWO FACES AS INDICATED.
ARROW POINTS IN DIRECTION OF EGRESS.

LUMINAIRE, WALL WASHER

SWITCHES/RECEPTACLES

SINGLE POLE SWITCH
a = CIRCUIT DESIGNATION
b = DEVICE SWITCHED DESIGNATION
c = TYPE
2 = DOUBLE POLE SWITCH
3 = THREE-WAY SWITCH
3P = THREE POSITION SWITCH
4 = FOUR-WAY SWITCH
K = KEY OPERATED SWITCH
F = SWITCH AND FUSESTAT HOLDER
P = SWITCH AND PILOT LIGHT
T = THERMOSTAT
D = DIMMER SWITCH
L = LOW VOLTAGE LIGHT SWITCH
M = MANUAL MOTOR STARTER
N = NETWORKED SINGLE OR MULTIPLE SWITCH LOCATIONS

REFER TO ABBREVIATIONS LEGEND FOR ALL OTHER DESIGNATIONS.

OCCUPANCY SENSOR
X = REFERENCE LIGHTING CONTROL COMPONENT SCHEDULE
a = CIRCUIT DESIGNATION
b = DEVICE SWITCHED DESIGNATION
c = MOUNTING HEIGHT IN FEET TO BOTTOM OF SENSOR

PE — PHOTOCELL

SWITCH AND SINGLE RECEPTACLE
a = CIRCUIT DESIGNATION
b = DEVICE TYPE DESIGNATION

DUPLEX RECEPTACLE

QUADRUPLEX RECEPTACLE

IN FLOOR DUPLEX RECEPTACLE

IN FLOOR QUADRUPLEX RECEPTACLE

DUPLEX RECEPTACLE w/SPLIT WIRE

APPLIANCE RECEPTACLE

SPECIAL PURPOSE RECEPTACLE

WELDING RECEPTACLE
a = CIRCUIT DESIGNATION
b = DISCONNECT TYPE

TWIST LOCK RECEPTACLE
a = AMP RATING

TELEPHONE OUTLET
a = CIRCUIT DESIGNATION
b = MOUNTING HEIGHT

DATA COMMUNICATIONS OUTLET
a = CIRCUIT DESIGNATION
b = MOUNTING HEIGHT

FIRE ALARM

SMOKE DETECTOR
a = TYPE
I = IONIZATION
P = PHOTOELECTRIC
d = DUCT DETECTOR

FACP — FIRE ALARM CONTROL PANEL

F — FIRE ALARM PULL STATION

FH — FIRE ALARM HORN/STROBE COMBINATION

FS — FIRE ALARM STROBE

F — FIRE SPRINKLER
F = FLOW SWITCH
T = TAMPER SWITCH

RACEWAY

EXPOSED CONDUIT

BREAK AND CONTINUATION IN CONDUIT RUN

EXPOSED CONDUIT HIDDEN BEHIND WALLS, FLOORS OR OTHER STRUCTURES

UNDERGROUND CONDUIT, DIRECT BURIED OR IN DUCT BANK

CONDUIT IN SLAB

CONDUIT VERTICAL CHANGE IN DIRECTION

CONDUIT CAP

J — JUNCTION BOX

CONDUIT SEAL

CONDUIT TEE

DUCT BANK
APPROXIMATE DIMENSIONS SHOWN ON DUCT BANK SECTIONS

CONDUIT SIZE AND CONDUCTORS

INDIVIDUAL CONDUCTORS

W"C-(3-X (Ø), 1-Y (N) & 1-Z (G))

W"C (WHERE INDICATED): W = CONDUIT TRADE SIZE

3-X (Ø):
3 = QUANTITY
X = SIZE OF CONDUCTORS
(Ø) = DESIGNATES PHASE CONDUCTORS

1-Y (N)(WHERE INDICATED):
1 = QUANTITY
Y = SIZE OF CONDUCTORS
(N) = DESIGNATES NEUTRAL CONDUCTORS

1-Z (G)(WHERE INDICATED):
1 = QUANTITY
Z = SIZE OF CONDUCTORS
(G) = DESIGNATES GROUND CONDUCTORS

U{3-X (Ø) & 1-X (G)}
U = NUMBER OF PARALLEL RUNS

MULTI CONDUCTOR CABLES

K/2/C#16S
K (WHERE INDICATED) = NUMBER OF PAIRS
2/C#16S = TWO CONDUCTOR, 16 GAUGE, TWISTED SHIELDED PAIR

K/3/C#16S
K (WHERE INDICATED) = NUMBER OF TRIPLETS
3/C#16S = THREE CONDUCTOR, 16 GAUGE, TWISTED SHIELDED TRIPLETS

N/CX
N = NUMBER OF CONDUCTORS IN THE CABLE
X = SIZE OF CONDUCTORS

FIBER OPTIC CABLES

FO/N
N = NUMBER OF INDIVIDUAL FIBERS

GROUNDING

UNDERGROUND GROUND CABLE
#4/0 SDBC UNLESS OTHERWISE NOTED

GROUND ROD

GROUND ROD AND GROUND WELL

ELECTRICAL ONE-LINE SYMBOLS

MEDIUM VOLTAGE

52 — CIRCUIT BREAKER, MEDIUM VOLTAGE
a = CIRCUIT BREAKER NUMBER
b = FRAME SIZE

ANSI RELAY DEVICE
a = ANSI DEVICE FUNCTION
b = QUANTITY

MEDIUM VOLTAGE DISCONNECT SWITCH NON-FUSED CUT OUT

MEDIUM VOLTAGE DISCONNECTING FUSE SINGLE FUSE CUT OUT

MEDIUM VOLTAGE DISCONNECTING FUSE DOUBLE FUSE CUT OUT

MEDIUM VOLTAGE SINGLE FUSE

MEDIUM VOLTAGE DOUBLE FUSE

MEDIUM VOLTAGE LIVE FRONT TERMINATOR

MEDIUM VOLTAGE ELBOW

MEDIUM VOLTAGE TEE

MEDIUM VOLTAGE CONTACTOR

MEDIUM VOLTAGE STARTER

MOV-ELBOW ARRESTER

LOW VOLTAGE

LOW VOLTAGE CIRCUIT BREAKER
a = TYPE
MCP = MOTOR CIRCUIT PROTECTOR
TM = THERMAL MAGNETIC
SS = SOLID STATE
b = FRAME SIZE (MANUFACTURER TO DETERMINE FRAME SIZE UNLESS INDICATED)
c = NUMBER OF POLES
d = TRIP SETTING (AT = AMP TRIP) (AC = MCP CONTINUOUS RATING)
e = DESIGNATION
f = INTERRUPTING RATING

LOW VOLTAGE CIRCUIT BREAKER AUXILIARY OPERATOR
* = S = SHUNT TRIP
= G = GROUND FAULT INTERRUPTER
= V = SOLENOID KEY RELEASE

A — DISCONNECT SWITCH
A = TYPE, REFER TO DISCONNECT SCHEDULE

B — FUSED DISCONNECT SWITCH
B = TYPE, REFER TO DISCONNECT SCHEDULE
b = FUSE RATING

FUSE

COMBINATION STARTER WITH CONTROL POWER TRANSFORMER
a = CIRCUIT BREAKER DISCONNECT, TYPE AS NOTED
b = STARTER TYPE
c = NEMA STARTER SIZE
d = OVERLOAD

MOTOR STARTER/DRIVES:
a = DEVICE TYPE
VFD-6 = 6-PULSE VFD
VFD-18 = 18-PULSE VFD
RVSS = REDUCED VOLTAGE SOLID STATE STARTER
RVAT = REDUCED VOLTAGE AUTO TRANSFORMER
a/B = DEVICE WITH BYPASS STARTER. REFER TO THE SPECIFICATIONS

b = INPUT OPTIONS
LL = LINE REACTOR
PHF = PASSIVE HARMONIC FILTER

c = OUTPUT OPTIONS
LR = LOAD REACTOR
DV/DT = Dv/dt FILTER
SWF = SINE WAVE FILTER

EQUIPMENT ENCLOSURE

MISCELLANEOUS

HP — MOTOR
HP = HORSEPOWER RATING
FULL LOAD AMPS AS NOTED

PACKAGED EQUIPMENT
LOAD RATING AS INDICATED
a = RATED LOAD
b = UNIT(HP, KW, KVA) AS INDICATED

TRANSFORMER
a = DEVICE I.D.
b = KVA RATING
c = NUMBER OF PHASES
d = PRIMARY VOLTAGE
e = SECONDARY VOLTAGE
f,g = CONNECTION TYPE SYMBOL
h = IMPEDANCE

GROUNDED WYE CONNECTION

DELTA CONNECTION

G — ENGINE-GENERATOR RATINGS AS INDICATED ON THE DRAWINGS
a = KVA/KW
b = VOLTAGE/CONNECTION
c = PHASE
d = WIRE
e = PF

CURRENT TRANSFORMER WITH SHORTING TERMINAL BLOCK
a = QUANTITY
b = RATIO

POTENTIAL TRANSFORMER
a = QUANTITY
b = RATIO
c,d = CONNECTION TYPE SYMBOL

SSM — SOLID STATE MULTIFUNCTION METER

ATP — AMPERE TEST POINT

VTP — VOLTAGE TEST POINT

UTILITY METER

LIGHTNING ARRESTER

SPD — SURGE PROTECTIVE DEVICE

DRAWOUT CONNECTION

GROUND

CAPACITOR

BATTERY

K — KIRK KEY INTERLOCK

LOAD BANK

APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

Manatee County BCC

DESIGNED	CE
DRAWN	CE
CHECKED	CE
DATE	MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
LEGEND

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 — 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 00GE01
SHEET NO. 12 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0000GE001.dgn

Plot Date: 27-DEC-2017 11:52:43 AM
User: bshepard
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: SBoyd

ABBREVIATIONS

A	AMP
ABS	ABSOLUTE
AC	ALTERNATING CURRENT
ACK	ACKNOWLEDGE
ACTR	ACTUATOR
AF	AMP FRAME
AFC	AUTOMATIC FREQUENCY CONTROL
AIC	AMP INTERRUPTING CAPACITY
AM	AMMETER
ANN	ANNUNCIATOR
ANT	ANTENNA
APU	AUXILIARY POWER UNIT
ARM	ARMORED CABLE
AS	AMMETER SWITCH
ASYM	ASYMMETRICAL
AT	AMP TRIP
ATO	AUTOMATIC THROW OVER
ATP	AMMETER TEST POINT
ATS	AUTOMATIC TRANSFER SWITCH
AUTO XFMR	AUTOMATIC TRANSFORMER
AUX	AUXILIARY
AWG	AMERICAN WIRE GAGE
B	BELL
BAT	BATTERY
BFG	BELOW FINISHED GRADE
BHP	BRAKE HORSEPOWER
BKR	BREAKER
BRF	BELOW RAISED FLOOR
C	CONDUIT / CONTINUOUS LOAD
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CCW	COUNTER CLOCKWISE
CKT	CIRCUIT
COAX	COAXIAL CABLE
COM	COMMON
COMM	COMMUNICATION
CPT	CONTROL POWER TRANSFORMER
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CV	CONTROL VALVE
CW	CLOCKWISE / COOL WHITE
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
DCU - X	DISTRIBUTED CONTROL UNIT NO. X
DEMO	DEMOLITION
DISC	DISCONNECT SWITCH
DM	DEMAND METER
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DS	DOOR SWITCH
E/G	EMERGENCY GENERATOR
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ENG	ENGINE
ENT	ELECTRICAL NON-METALLIC TUBING
EP	EXPLOSION PROOF
ETM	ELAPSED TIME METER
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FDR	FEEDER
FLA	FULL LOAD AMPS
FLX	FLEXIBLE CONDUIT
FO	FIBER OPTIC
FRC	FIBERGLASS RIGID CONDUIT
FREQ	FREQUENCY
FU	FUSE
FU	SW FUSED SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
FWD	FORWARD
G	GROUND / EQUIPMENT GROUND / GROUND FAULT
GEN	GENERATOR
GRC	GALVANIZED STEEL RIGID CONDUIT
GFCI	GROUND FAULT CIRCUIT INTERRUPTER (RECEPTACLE)
GFI	GROUND FAULT INTERRUPTER (BREAKER)
GFR	GROUND FAULT RELAY
H	HOT-LEG
HF	HIGH FREQUENCY
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HOUR
HSTAT	HUMIDISTAT
HV	HIGH VOLTAGE
HVAC	HEATING/VENTILATION/AIR CONDITIONING
HZ	HERTZ
I	INSTANTANEOUS LOAD
IC	INTERRUPTING CAPACITY
IJB	INSTRUMENT JUNCTION BOX
IMC	INTERMEDIATE METAL CONDUIT
INST	INSTANTANEOUS
INT	INTERLOCK
INTERCOM	INTERCOMMUNICATION
J	JUNCTION BOX
K	KEY INTERLOCK
KA	KILOAMP
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVAR (REACTANCE)
KW	KILOWATT
KWD	KILOWATT DEMAND
KWH	KILOWATT HOUR
L	LONG-TIME
L-B	LINE-BUS
L-G	LINE-GROUND
LA	LIGHTNING ARRESTOR
LBL	LABEL
LC	LIGHTING CONTACTOR
LCP- X	LOCAL CONTROL PANEL NO. X
LP	LIGHT POLE
LR	LEAD-LAG LOAD REACTOR
LTG	LIGHTING
LV	LOW VOLTAGE
LVL	LEVEL
M-X	MOTOR CONTROLLER NO. X
MA	MILLIAMPERE
MCA	MOTOR CIRCUIT AMPS
MCC - X	MOTOR CONTROL CENTER NO. X
MCP	MOTOR CIRCUIT PROTECTOR
MH	MANHOLE / MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MOD	MOTOR OPERATED DAMPER
MOV	METAL OXIDE VARISTOR
MRP	MOTOR PROTECTION RELAY
MS-X	MOTOR STARTER NO. X
MSP	MOTOR STARTING PANEL
MTO	MANUAL THROW OVER
MTR-X	MOTOR NO. X
MTS	MANUAL TRANSFER SWITCH
MV	MEGAVOLT
MVA	MEGAVOLT-AMPERES
MVS	MEDIUM VOLTAGE SWITCH
MW	MEGAWATT
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NFC	NONMETALLIC FLEXIBLE CONDUIT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NP	NAMEPLATE
O	OPEN OR OPENED
OH	OVERHEAD
OL	OVERLOAD RELAY
P	POLE
PA	PUBLIC ADDRESS
PANEL-LX	LIGHTING PANEL NO.X
PANEL-PX	POWER DISTRIBUTION PANEL NO. X
PB	PUSHBUTTON / PULL BOX
PC-X	MINI POWER CENTER NO. X
PCS	PVC COATED GALVANIZED STEEL CONDUIT
PCM	PROCESS CONTROL MODULE
PE	PHOTOCELL
PF	POWER FACTOR
PFCC	POWER FACTOR CORRECTION CAPACITOR
PFR	PHASE FAILURE RELAY
PH	PHASE
PNL	PANEL
PPX	POWER PANEL NO. X
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE RIGID PLASTIC CONDUIT
PWR	POWER
RAC	RIGID ALUMINUM CONDUIT
RECPT	RECEPTACLE
REV	REVERSE
RF	RADIO FREQUENCY
RMS	ROOT MEAN SQUARED
RVAT	REDUCED VOLTAGE AUTO TRANSFORMER
RVNR	REDUCED VOLTAGE NON-REVERSING
RVSS	REDUCED VOLTAGE SOLID STATE
S	SHIELD / SHORT-TIME
SA	SURGE ARRESTER
SC	SHORT CIRCUIT
SDBC	SOFT DRAWN BARE COPPER
SFL	SUB FEED LUGS
SLT	SEALTIGHT LIQUIDTIGHT FLEXIBLE CONDUIT
SM	SURFACE MOUNTED
SP	SINGLE POLE
SPD	SURGE PROTECTIVE DEVICE
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SPKR	SPEAKER
SS	SOLID STATE
STB	SHORTING TERMINAL BLOCK
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMECTRICAL
TACH	TACHOMETER
TB - X	TERMINAL BLOCK - UNIT X
TC	THERMOCOUPLE / TIME CLOCK / TRAY CABLE
TD	TEMPERATURE DETECTOR RELAY
TE	TOTALLY ENCLOSED
TEFC	TOTALLY ENCLOSED FAN COOLED
TENV	TOTALLY ENCLOSED NON-VENTILATED
TERM	TERMINAL
TJB	TERMINAL JUNCTION BOX
TM	THERMAL MAGNETIC
TP	TWISTED PAIR
TS	TEMPERATURE SWITCH
TS1W	TWO SPEED CONSEQUENT POLE, ONE WINDING
TS2W	TWO SPEED SEPARATE WINDING
TSTAT	THERMOSTAT
UHF	ULTRA HIGH FREQUENCY
UNG	UNGROUNDED
UPS	UNINTERRUPTABLE POWER SUPPLY
UVR	UNDER VOLTAGE RELAY
V	VOLT
VA	VOLT AMPERE
VAR	VARMETER
VCP	VENDOR CONTROL PANEL
VFD	VARIABLE FREQUENCY DRIVE
VHF	VERY HIGH FREQUENCY
VM	VOLTMETER
VP	VAPORPROOF
VR	VOLTAGE REGULATOR
VS	VOLTAGE SWITCH
VT	VOLTAGE TRANSFORMER
VTP	VOLTAGE TEST POINT
W	WATT / WEST
WT	WATER TIGHT
WP	WEATHER PROOF
XFMR	TRANSFORMER

POWER DEVICE FUNCTION NUMBERS

1	MASTER ELEMENT
2	TIME-DELAY STARTING OR CLOSING RELAY
3	CHECKING OR INTERLOCKING RELAY
4	MASTER CONTACTOR
5	STOPPING DEVICE
6	STARTING CIRCUIT BREAKER
7	ANODE CIRCUIT BREAKER
8	CONTROL POWER DISCONNECTING DEVICE
9	REVERSING DEVICE
10	UNIT SEQUENCE SWITCH
11	MULTIFUNCTION DEVICE
12	OVER-SPEED DEVICE
13	SYNCHRONOUS-SPEED DEVICE
14	UNDER-SPEED DEVICE
15	SPEED OR FREQUENCY MATCHING DEVICE
16	DATA COMMUNICATIONS DEVICE
17	SHUNTING OR DISCHARGE SWITCH
18	ACCELERATING OR DECELERATING DEVICE
19	STARTING-TO-RUNNING TRANSITION CONTACTOR
20	ELECTRICALLY OPERATED VALVE
21	DISTANCE RELAY
22	EQUALIZER CIRCUIT BREAKER
23	TEMPERATURE CONTROL DEVICE
24	VOLTS PER HERTZ RELAY
25	SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE
26	APPARATUS THERMAL DEVICE
27	UNDERVOLTAGE RELAY
27N	GROUND FAULT UNDERVOLTAGE RELAY
28	FLAME DETECTOR
29	ISOLATING CONTACTOR
30	ANNUNCIATOR RELAY
31	SEPARATE EXCITATION DEVICE
32	DIRECTIONAL POWER RELAY
33	POSITION SWITCH
34	MASTER SEQUENCE DEVICE
35	BRUSH-OPERATING OR SLIP-RING SHORT-CIRCUITING DEVICE
36	POLARITY DEVICE
37	UNDERCURRENT OR UNDERPOWER RELAY
38	BEARING PROTECTIVE DEVICE
39	MECHANICAL CONDITION MONITOR
40	FIELD RELAY
41	FIELD CIRCUIT BREAKER
42	RUNNING CIRCUIT BREAKER
43	MANUAL TRANSFER OR SELECTOR DEVICE
44	UNIT SEQUENCE STARTING RELAY
45	ABNORMAL ATMOSPHERIC CONDITION MONITOR
46	REVERSE-PHASE OR BALANCE CURRENT RELAY
47	PHASE-BALANCE OR PHASE-SEQUENCE VOLTAGE RELAY
48	INCOMPLETE SEQUENCE RELAY
49	MACHINE OR TRANSFORMER THERMAL RELAY
50	INSTANTANEOUS OVERCURRENT RELAY
51	AC TIME OVERCURRENT RELAY
52	AC CIRCUIT BREAKER
53	FIELD EXCITATION RELAY
54	TURNING GEAR ENGAGING DEVICE
55	POWER FACTOR RELAY
56	FIELD APPLICATION RELAY
57	SHORT-CIRCUITING OR GROUNDING DEVICE
58	RECTIFICATION FAILURE RELAY
59	OVERVOLTAGE RELAY
60	VOLTAGE OR CURRENT BALANCE RELAY
61	DENSITY SWITCH OR SENSOR
62	TIME-DELAY STOPPING OR OPENING RELAY
63	PRESSURE SWITCH
64	GROUND DETECTOR RELAY
65	GOVERNOR
66	NOTCHING OR JOGGING DEVICE
67	AC DIRECTIONAL OVERCURRENT RELAY
68	BLOCKING OR OUT OF STEP RELAY
69	PERMISSIVE CONTROL DEVICE
70	RHEOSTAT
71	LIQUID LEVEL SWITCH
72	DC CIRCUIT BREAKER
73	LOAD-RESISTOR CONTACTOR
74	ALARM RELAY
75	POSITION CHANGING MECHANISM
76	DC OVERCURRENT RELAY
77	TELEMETERING DEVICE
78	PHASE-ANGLE MEASURING RELAY
79	AC RECLOSING RELAY
80	FLOW SWITCH
81	FREQUENCY RELAY
82	DC LOAD MEASURING RECLOSING RELAY
83	AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY
84	OPERATING MECHANISM
85	PILOT COMMUNICATIONS, CARRIER OR PILOT-WIRE RELAY
86	LOCKOUT RELAY
87	DIFFERENTIAL PROTECTIVE RELAY
88	AUXILIARY MOTOR OR MOTOR GENERATOR
89	LINE SWITCH
90	REGULATING DEVICE
91	VOLTAGE DIRECTIONAL RELAY
92	VOLTAGE AND POWER DIRECTIONAL RELAY
93	FIELD-CHANGING CONTACTOR
94	TRIPPING OR TRIP-FREE RELAY

COMMONLY USED SUFFIX LETTERS APPLIED TO POWER DEVICE FUNCTION NUMBERS

A	ALARM ONLY
B	BUS PROTECTION
G	GROUND FAULT PROTECTION (RELAY CT IN A SYSTEM NEUTRAL CIRCUIT OR GENERATOR PROTECTION)
GS	GROUND FAULT PROTECTION (RELAY CT IN TOROIDAL OR GROUND SENSOR TYPE)
L	LINE PROTECTION
M	MOTOR PROTECTION
N	GROUND FAULT PROTECTION (RELAY COIL CONNECTED IN RESIDUAL CT CIRCUIT)
T	TRANSFORMER PROTECTION
V	VOLTAGE
P	PHASE PROTECTION

ABBREVIATIONS

AFD	- ARC FLASH DETECTOR
CLK	- CLOCK OR TIMING SOURCE
DDR	- DYNAMIC DISTURBANCE RECORDER
DFR	- DIGITAL FAULT RECORDER
ENV	- ENVIRONMENTAL DATA
HIZ	- HIGH IMPEDANCE FAULT DETECTOR
HMI	- HUMAN MACHINE INTERFACE
HST	- HISTORIAN
LGC	- SCHEME LOGIC
MET	- SUBSTATION METERING
PDC	- PHASOR DATA CONCENTRATOR
PMU	- PHASOR MEASUREMENT UNIT
PQM	- POWER QUALITY MONITOR
RIO	- REMOTE I/O DEVICE
RTU	- REMOTE TELEMETRY UNIT/REMOTE TERMINAL UNIT
SER	- SEQUENCE OF EVENTS RECORDER
TCM	- TRIP CIRCUIT MONITOR

NOTES:

1. REFER TO SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL ABBREVIATIONS.

APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

Manatee County BCC

DESIGNED CE | DRAWN CE | CHECKED CE | DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY

SEWRF ELECTRICAL MASTER PLAN

ELECTRICAL

ABBREVIATIONS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

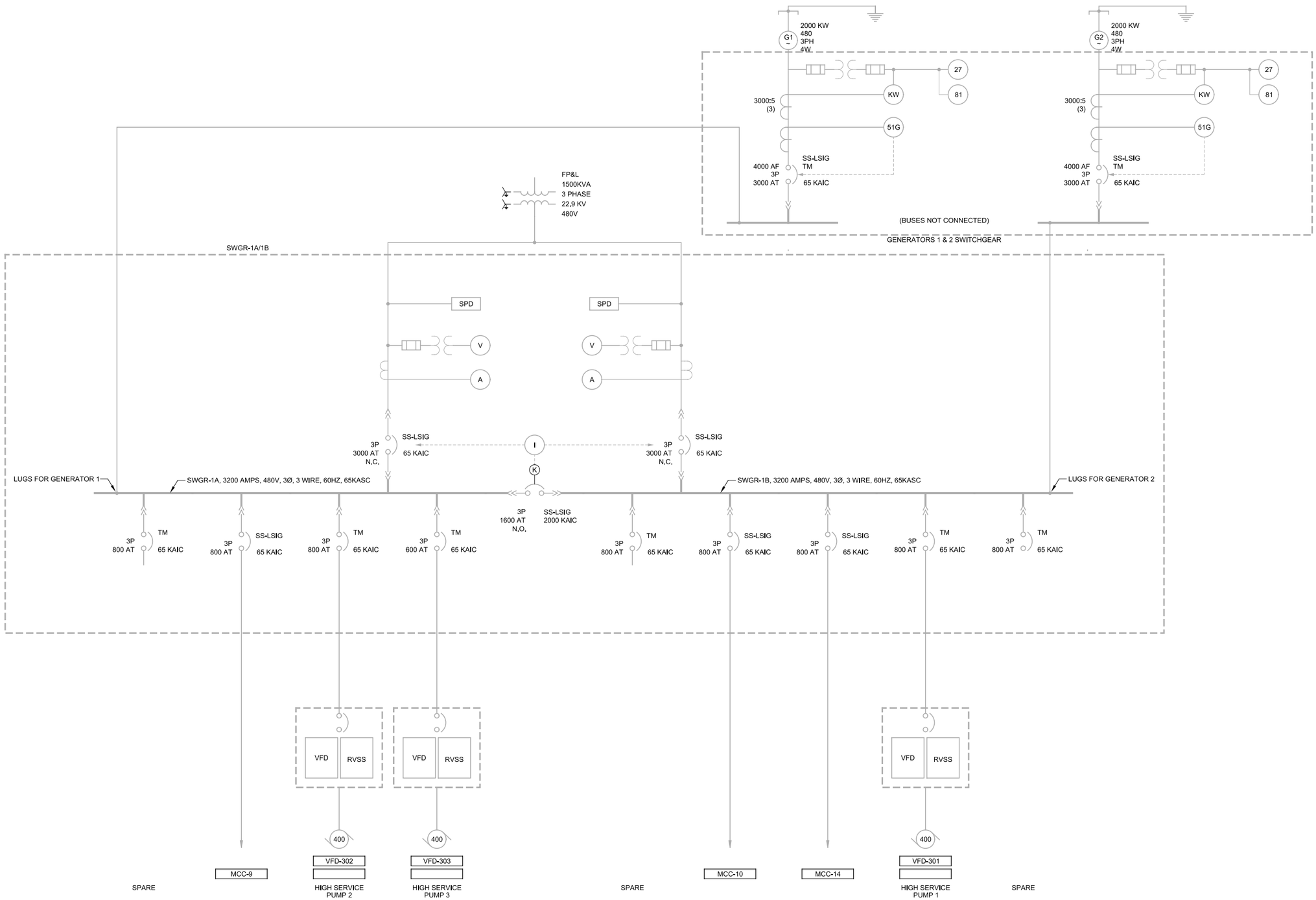
JOB NO. 10096N.00

DRAWING NO. 00GE02

SHEET NO. 13 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0000GE002.dgn

Plot Date: 27-DEC-2017 11:52:48 AM
User: bshepard
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1
LAST SAVED BY: SBoyd



APPENDIX A

PRELIMINARY DESIGN
SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

DESIGNED AHR
DRAWN SMB
CHECKED
DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

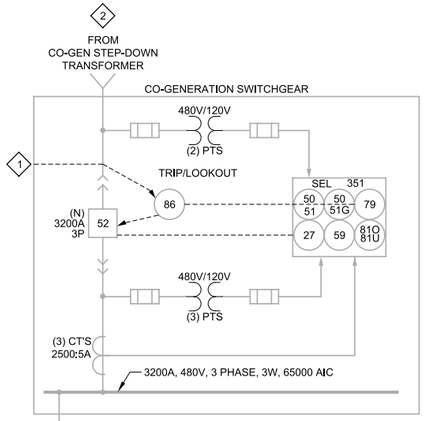
MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
SWGR-1A/2B
ONE-LINE DIAGRAM

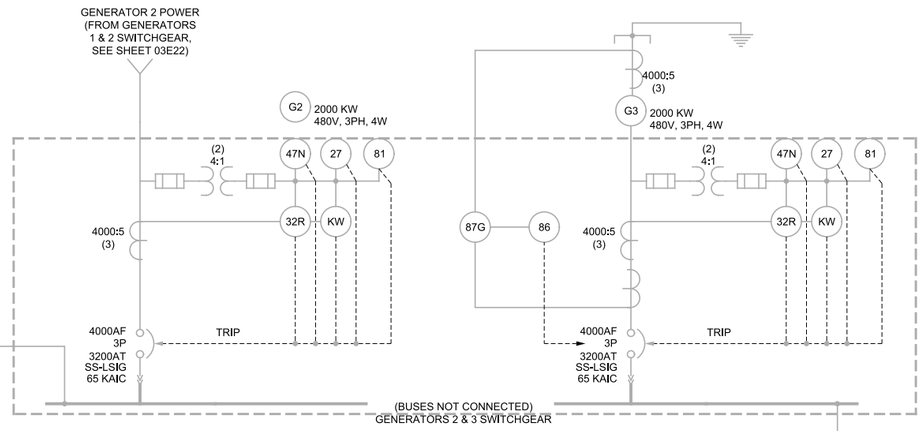
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

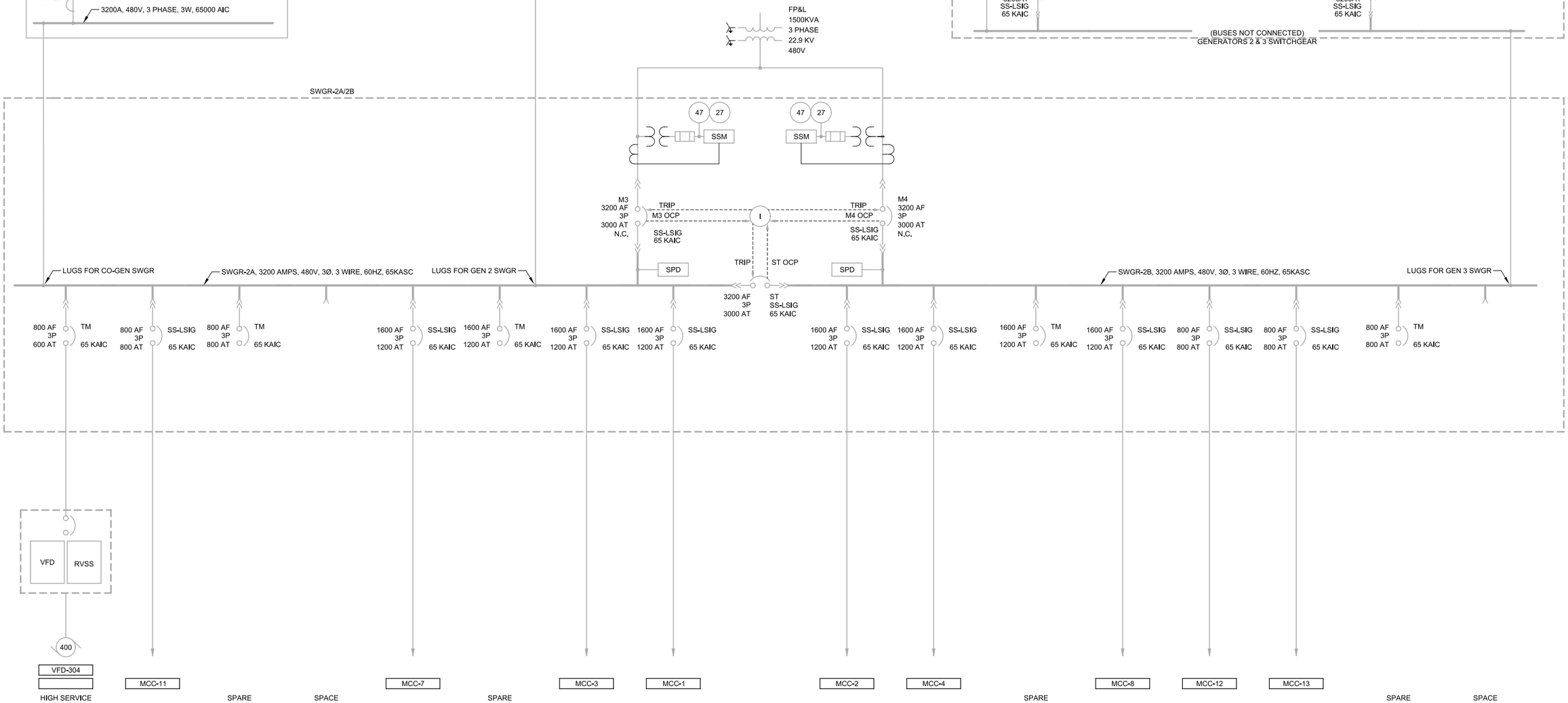
JOB NO. 10096N.00
DRAWING NO. 03E01
SHEET NO. OF XX

KEY NOTES:

1. INTERCONNECTION FROM CO-GENERATION SYSTEM.
2. CO GEN GENRATOR SI 1600 KW 4.16 KV. 0.8 PF.
   CO-GEN TRANSFORMER IS 2000 KVA, 4.16 KV TO 480V, 5.75%.







APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

DESIGNED AHR
DRAWN SMB
CHECKED
DATE MAY 2017

Manatee County BCC

carollo®
Request for Qualifications No. 24-TA005084SAM

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
SWGR-2A/2B
ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E02
SHEET NO. 15 OF XX

MCC-1, 1200 AMPS, 480 VOLTS, 3 (Ø), 3 WIRE, 60 HZ, 65 KASC RMS

SSM

3
1200:5

3P
1200 AT

SS-LSIG

65 KAIC

K

3P
800 AT

TM

65 KAIC

SPD

CONTINUED AT LOWER LEFT

3P 250 AC	3P 250 AC	3P 250 AC	3P 50 AC	3P 50 AC	3P 100 AT	3P 100 AT	3P 15 AT	3P 15 AT				
MCP 65 KAIC TS2W	MCP 65 KAIC TS2W	MCP 65 KAIC TS2W	MCP 65 KAIC FVNR SIZE 2	MCP 65 KAIC FVNR SIZE 2	TM 65 KAIC FVR SIZE 2	TM 65 KAIC FVR SIZE 2	TM 65 KAIC	TM 65 KAIC				
125	125	125	15	15	VFD 30	VFD 30	0.5 HP	0.5 HP				
FROM SWGR-2A	TIE TO MCC-2	AERATOR 1A	AERATOR 1B	AERATOR 1C	ANOXIC MIXER 1A	ANOXIC MIXER 1B	RETURN MIXED LIQUOR PUMP 1A	RETURN MIXED LIQUOR PUMP 1B	CV-212 EQ BASIN BYPASS VALVE	EQ PUMPS OVERHEAD CRANE		

CONTINUED AT UPPER RIGHT

3P 15 AT	3P 225 AT	3P 15 AT	3P 15 AT	3P 250 AT								
TM 65 KAIC	SS-LSIG 65 KAIC	TM 65 KAIC	TM 65 KAIC	TM 65 KAIC								
0.5 HP		1 HP	5 KVA	60	60							
CV-217 PROTOCOL VALVE	MCC-1A	TRAIN 1 WEIR OPERATOR	NEW BUILDING OIL DISP.	16 ACRE PUMP STATION PUMP 1	16 ACRE PUMP STATION PUMP 2	SPARE	MCC-SEP					

16 ACRE PUMP STATION CONTROL PANEL

APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo

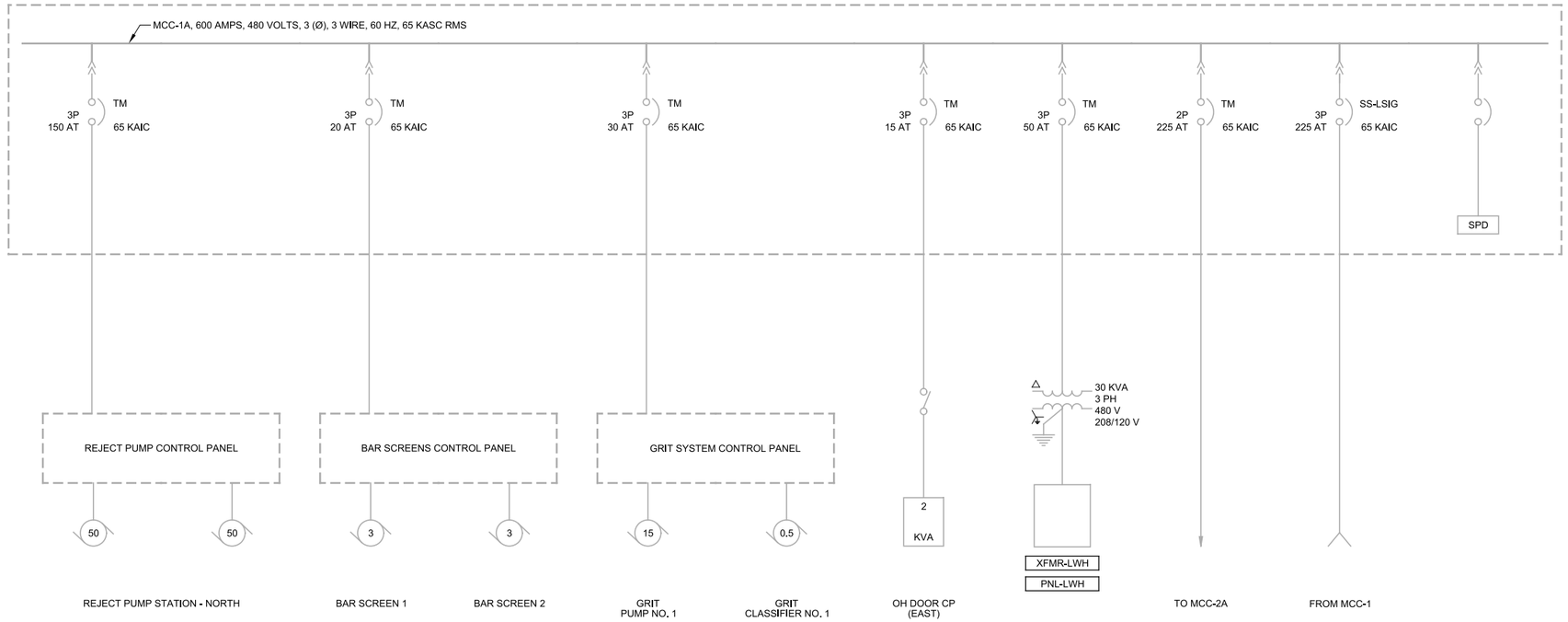
Request for Qualifications No. 24-TA005084SAM

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-1 ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E03
SHEET NO. OF XX

Manatee County BCC



APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

Manatee County BCC

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

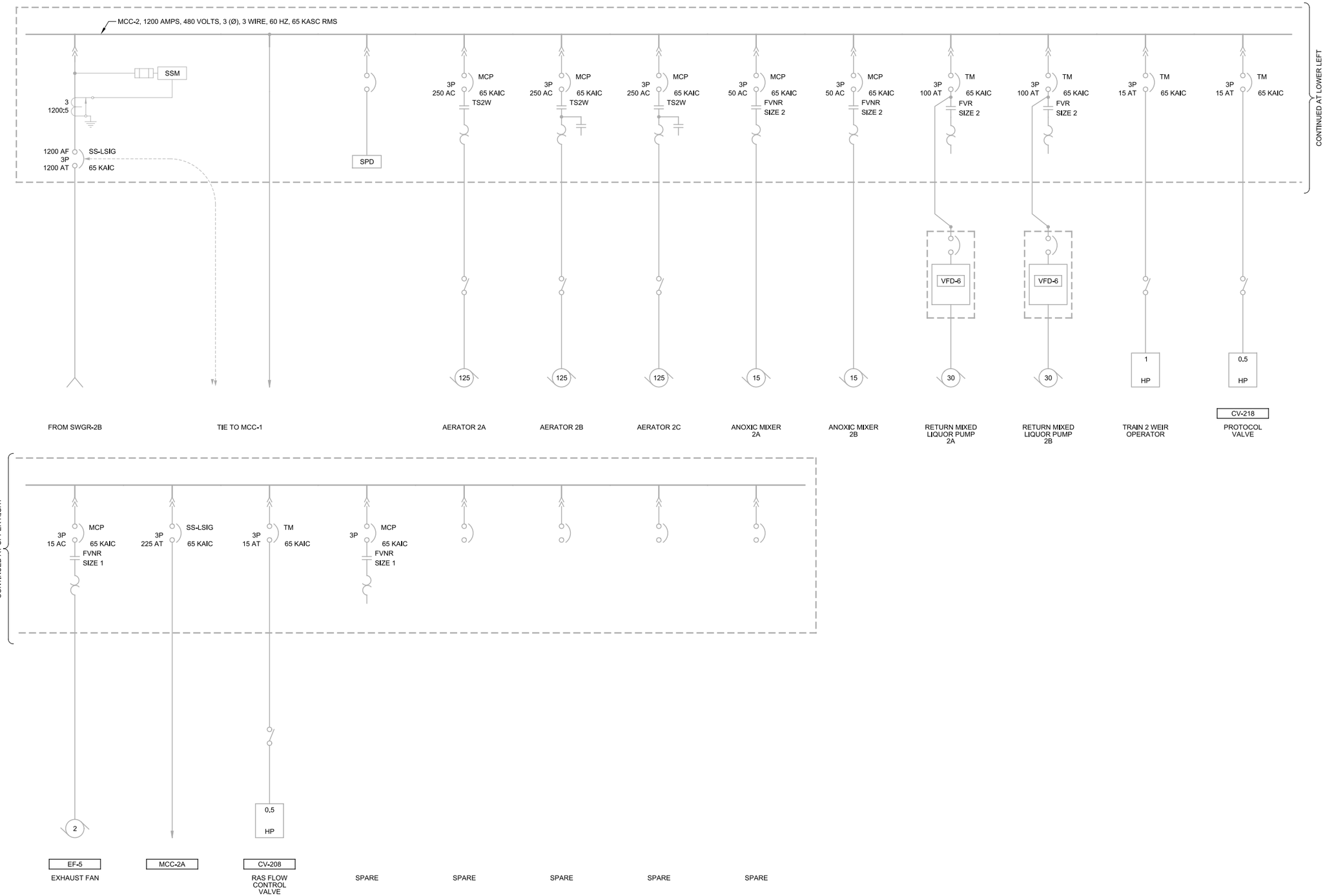
MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-1A ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E04
SHEET NO. 17 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E004.dgn

Plot Date: 27-DEC-2017 11:53:01 AM
User: bshepard
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1
LAST SAVED BY: bshepard



APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo®

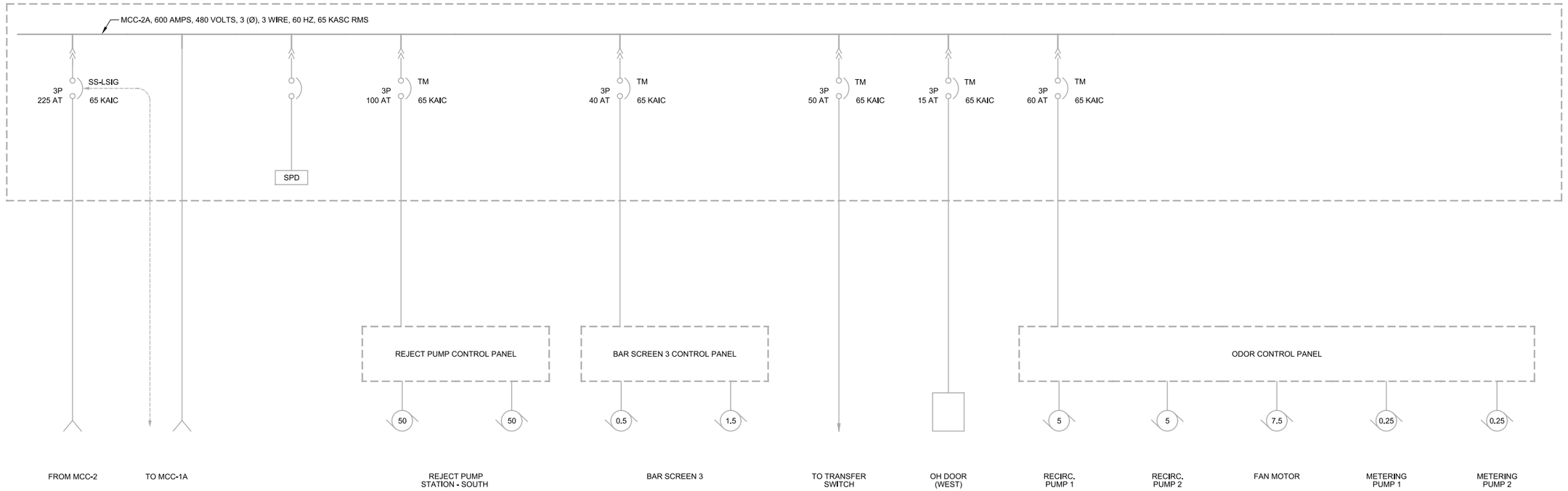
Request for Qualifications No. 24-TA005084SAM

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-2 ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E05
SHEET NO. OF XX

Manatee County BCC



APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

Manatee County BCC

DESIGNED AHR | DRAWN TCD | CHECKED | DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY

SEWRF ELECTRICAL MASTER PLAN

ELECTRICAL

MCC-2A ONE-LINE DIGRAM

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00

DRAWING NO. 03E06

SHEET NO. 19 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E006.dgn

Plot Date: 27-DEC-2017 11:53:07 AM
User: bshepard
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1
LAST SAVED BY: bshepard

MCC-3, 1200 AMPS, 480 VOLTS, 3 (Ø), 3 WIRE, 60 HZ, 65 KASC RMS

CONTINUED AT LOWER LEFT

CONTINUED AT UPPER RIGHT

1200 AF 3P 1200 AT	SS-LSIG 65 KAIC	800 AF 3P 800 AT	TM 65 KAIC	SPD	MCP 3P 250 AC 65 KAIC FVR	MCP 3P 250 AC 65 KAIC FVR	MCP 3P 250 AC 65 KAIC FVR	MCP 3P 30 AC 65 KAIC FVNR SIZE 2	MCP 3P 30 AC 65 KAIC FVNR SIZE 2	MCP 3P 50 AC 65 KAIC FVNR SIZE 3	MCP 3P 30 AC 65 KAIC FVNR SIZE 2	MCP 3P 30 AC 65 KAIC FVNR SIZE 2	MCP 3P 250 AC 65 KAIC RVAT
SSM	K												
3 1200:5													
					125	125	125	15	15	30	15	15	125
FROM SWGR-2A		TIE TO MCC-4			AERATOR 3A	AERATOR 3B	AERATOR 3C	ANOXIC MIXER 3A	ANOXIC MIXER 3B	EQUALIZATION PUMP NO.1	EQUALIZATION PUMP NO.3	EQUALIZATION PUMP NO.5	EQUALIZATION BLOWER NO. 1

TM 3P 90 AT 65 KAIC		MCP 3P 50 AC 65 KAIC FVNR SIZE 2		FVNR SIZE 2								
30 KVA 3 PH 480 V 208/120 V												
XFMR - L2												
PANEL-L2		PANEL PC/TC-2										
		SPARE		SPARE		SPARE						

APPENDIX A

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

Manatee County BCC

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo®

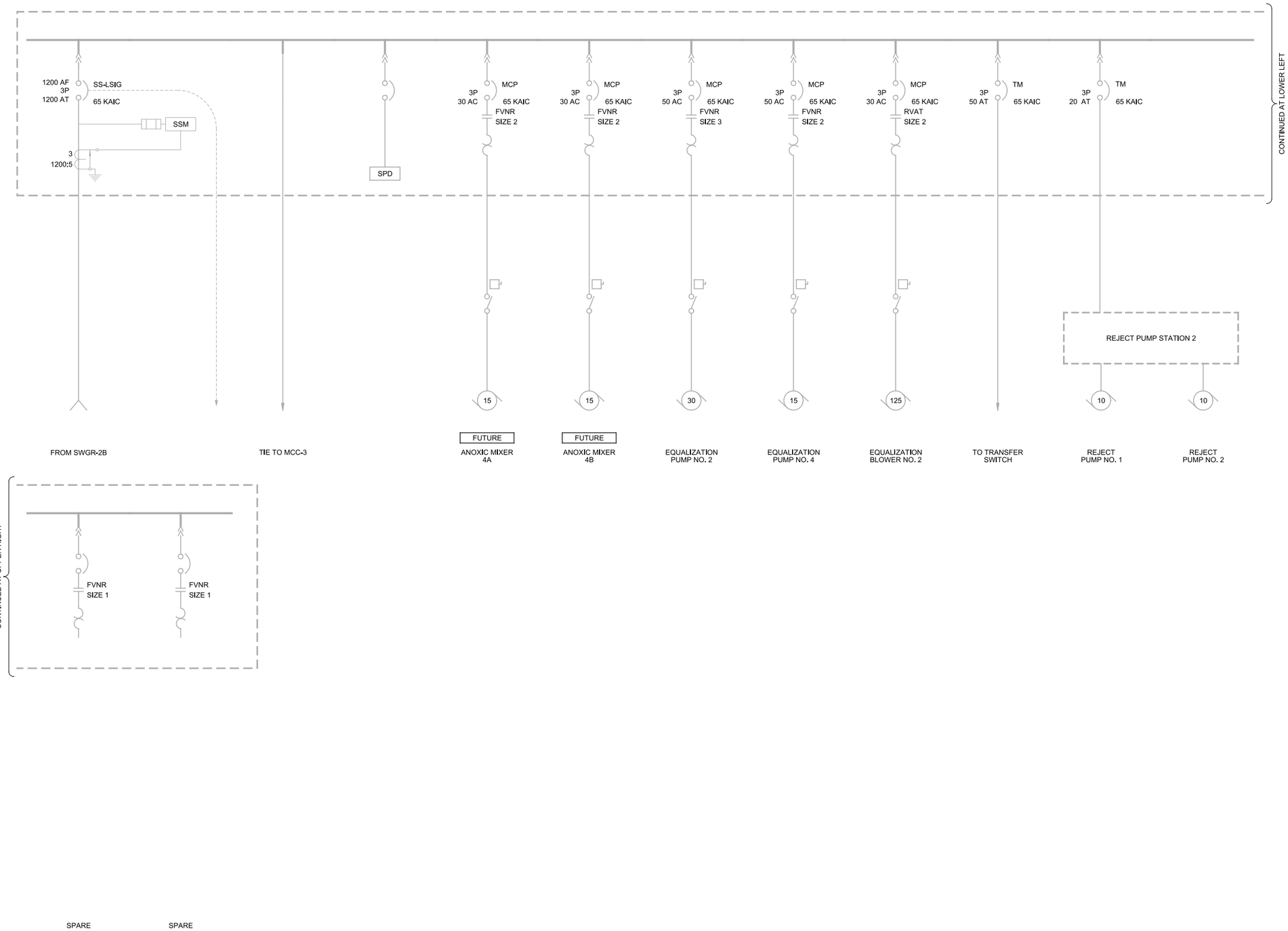
Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-3 ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E07
SHEET NO. OF XX



APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

DESIGNED AHR
DRAWN SMB
CHECKED
DATE MAY 2017

Manatee County BCC

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-4 ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E08
SHEET NO. 121 OF XX

MCC-5, 600 AMPS, 480 VOLTS, 3 (Ø), 3 WIRE, 60 HZ

600 AF
3P
400 AT
SS-LSIG
42 KAIC
FROM MCC-9

SPD

3P
20 AT
TM
42 KAIC
SPARE

3P
MCP
42 KAIC
FVNR
SIZE 3
SPARE

3P
20 AT
TM
42 KAIC
SPARE

3P
MCP
42 KAIC
FVNR
SIZE 3
SPARE

3P
70 AT
TM
42 KAIC
BFP 1
STANDBY PUMP

BELT FILTER PRESS 1 CONTROL PANEL

7.5
BFP 1 DRIVE

5
BFP 1
BOOSTER PUMP

7.5
BFP 1
HYDRAULIC
POWER

1

3P
20 AT
TM
42 KAIC
SPARE

3P
30 AT
TM
42 KAIC
SPARE

CONTINUED AT LOWER LEFT

KEY NOTES:

1. FROM MCC-6, SEE SHEET 03E10
2. ANALOG VOLMETER

CONTINUED AT UPPER RIGHT

3P
70 AT
TM
42 KAIC
BFP 3
STANDBY PUMP

BELT FILTER PRESS 3 CONTROL PANEL

7.5
BFP 3 DRIVE

5
BFP 3
BOOSTER PUMP

7.5
BFP 3
HYDRAULIC
POWER

1

MCP
42 KAIC
FVNR
SIZE 3
SPARE

MCP
42 KAIC
FVNR
SIZE 3
SPARE

3P
30 AT
TM
42 KAIC
SPARE

3P
30 AT
TM
42 KAIC
SPARE

MCP
42 KAIC
FVNR
SIZE 3
SPARE

3P
150 AT
MCP
42 KAIC
SPARE

3P
50 AT
TM
42 KAIC

1

30 KVA
3 PH
480 V
208/120 V

XFMR-LD
PANEL CDA
PANEL LCH
PANEL LP

3P
15 AT
TM
42 KAIC
CHLORINE
HOIST

3P
7 AC
MCP
42 KAIC
FVNR
SIZE 1
EXHAUST
FAN NO. 1

3P
7 AC
MCP
42 KAIC
FVNR
SIZE 1
EXHAUST
FAN NO. 2

APPENDIX A

PRELIMINARY DESIGN
SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

Manatee County BCC

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo

Request for Qualifications No. 24-TA005084SAM

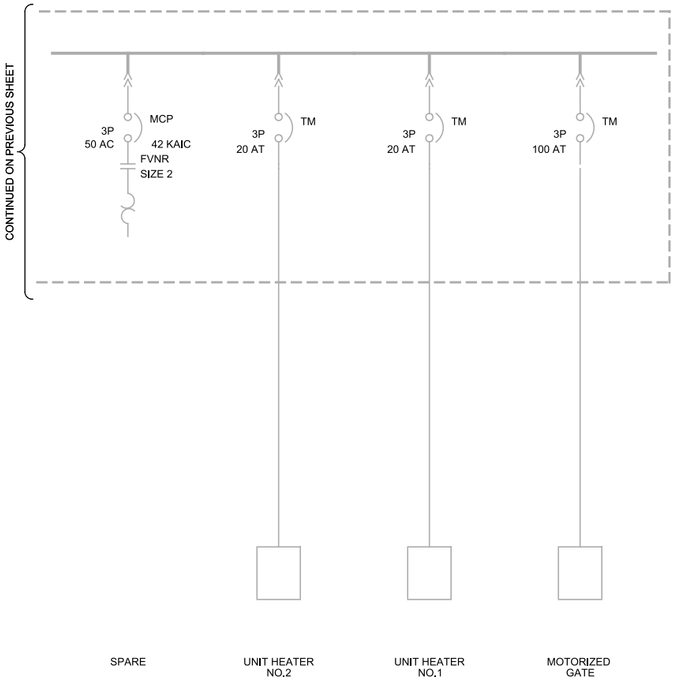
Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-5 ONE-LINE DIAGRAM - I

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E09
SHEET NO. 22 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E009.dgn



APPENDIX A

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

Manatee County BCC

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-5 ONE-LINE DIAGRAM - II

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E10
SHEET NO. 123 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E010.dgn

MCC-6, 600 AMPS, 480 VOLTS, 3 (Ø), 3 WIRE, 60 HZ

KEY NOTES:
1. ANALOG VOLT METER
2. SEE SHEET 03E07

300 AF 3P 400 AT	SPD	3P 20 AT	3P 7 AC	3P 7 AC	3P 50 AC	50 KW	3P 70 AT				3P 20 AT	
SS-LSIG 42 KAIC		TM	MCP FVNR SIZE 1	MCP FVNR SIZE 1	MCP FVNR SIZE 2	TM	TM				TM	
							BELT FILTER PRESS 2 CONTROL PANEL				GATE CONTROL PANEL	
FROM MCC-10		GARAGE DOOR	SPARE	SPARE	SPARE	WATER HEATER	BFP 2 STANDBY PUMP	BFP 2 DRIVE	BFP 2 BOOSTER PUMP	BFP 2 HYDRAULIC POWER	MOTORIZED GATE	
							7.5	5	7.5	1	1	

CONTINUED AT LOWER LEFT

CONTINUED AT UPPER RIGHT

3P 30 AT	3P 30 AT	2P 30 AT	3P 30 AT	3P 20 AT	3P	3P	3P 200 AT	3P	3P 50 AT	3P 30 AT		
TM	TM	TM	TM	TM	MCP FVNR SIZE 3	MCP FVNR SIZE 3	TM	MCP FVNR SIZE 3	TM	TM		
			CONVEYORS CONTROL PANEL									
		LIGHTING CONTACTOR	CONVEYOR 1	CONVEYOR 2	CONVEYOR 3	CONVEYOR 4	CONVEYOR 5	UNIT HEATER NO. 3	SPARE	SPARE	SPARE	SPARE
			0,5	1	1	1	0,5					

											10,8 A	
											TM	
											SIEMENS POLYMER MIA SYSTEM	
										2		
										TO TRANSFER SWITCH		

CONTINUED ON NEXT SHEET

APPENDIX A

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

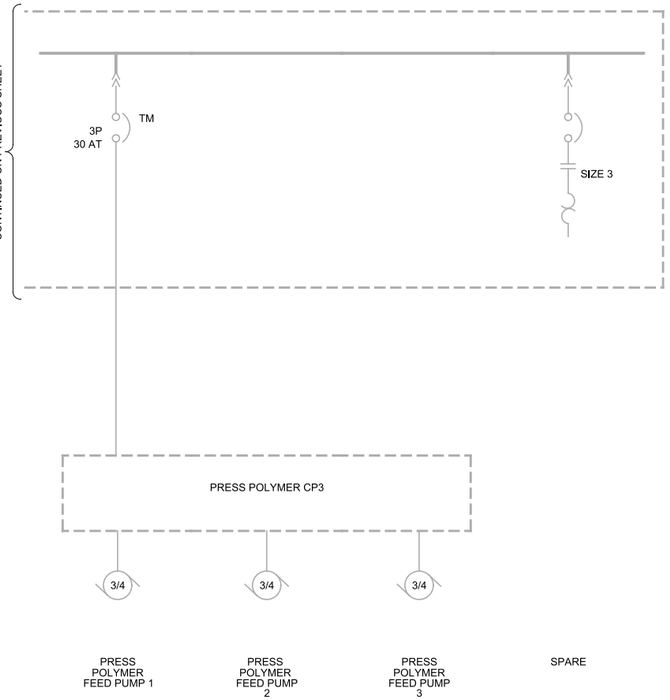
MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-6 ONE-LINE DIAGRAM - I

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E11
SHEET NO. 24 OF XX

Manatee County BCC

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E011.dgn



APPENDIX A

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION
			Manatee County BCC

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-6 ONE-LINE DIAGRAM - II

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E12
SHEET NO. 125 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E012.dgn

Plot Date: 27-DEC-2017 11:53:26 AM
User: bshepard
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: bshepard

MCC-7, 1200 AMPS, 480 VOLTS, 3 (Ø), 3 WIRE, 60 HZ, 65 KASC RMS

1200 AF 3P 1200 AT — SS-LSIG 65 KAIC — SSM — 3 1200:5 — FROM SWGR-2A

800 AF 3P 800 AT — TM 65 KAIC — TIE TO MCC-8

SPD

3P 600 AC — MCP 65 KAIC RVAT — 250 — SLUDGE BLOWER NO. 1

3P 600 AC — MCP 65 KAIC RVAT — 250 — SLUDGE BLOWER NO. 3

3P 30 AT — TM 65 KAIC — LL VFD-6 — 3 — 10 — VFD-301 — SLUDGE FEED PUMP NO. 1

3P 30 AT — TM 65 KAIC — LL VFD-6 — 3 — 10 — VFD-303 — SLUDGE FEED PUMP NO. 3

3P 30 AT — TM 65 KAIC — LL VFD-6 — 3 — 2 — 10 — VFD-305 — SLUDGE FEED PUMP NO. 5

3P 30 AT — TM 65 KAIC — GRAVITY BELT SLUDGE THICKENER 2 CONTROL PANEL — 2 — WASHWATER BOOSTER PUMP 2

1 — HYDRAULIC SYSTEM PUMP 2

2 — BELT DRIVE 2

0 AF 3P 30 AT — TM 65 KAIC — LL VFD-6 LR — 3 — 2 — 10 — VFD-307 — GRAVITY BELT DISCHARGE PUMP 1

CONTINUED AT LOWER LEFT

CONTINUED AT UPPER RIGHT

3P 50 AT — TM 65 KAIC — 1 — 30 KVA 3 PH 480 V 208/120 V — XFMR L3 — PANEL PC/TC — PANEL 63

3P 3 AC — MCP 65 KAIC FVNR SIZE 1 — 2 — EF-3 — EXHAUST FAN

3P 15 AT — TM 65 KAIC — SPARE

3P 15 AT — TM 65 KAIC — MOV-100

FVNR SIZE 2 — SPARE

KEY NOTES:

1. SUPPLY CIRCUIT FROM FEEDER BREAKER IN MCC-8, SEE 03E12.
2. WITH DV/DT FILTER.
3. INCLUDES BYPASS.

APPENDIX A

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo

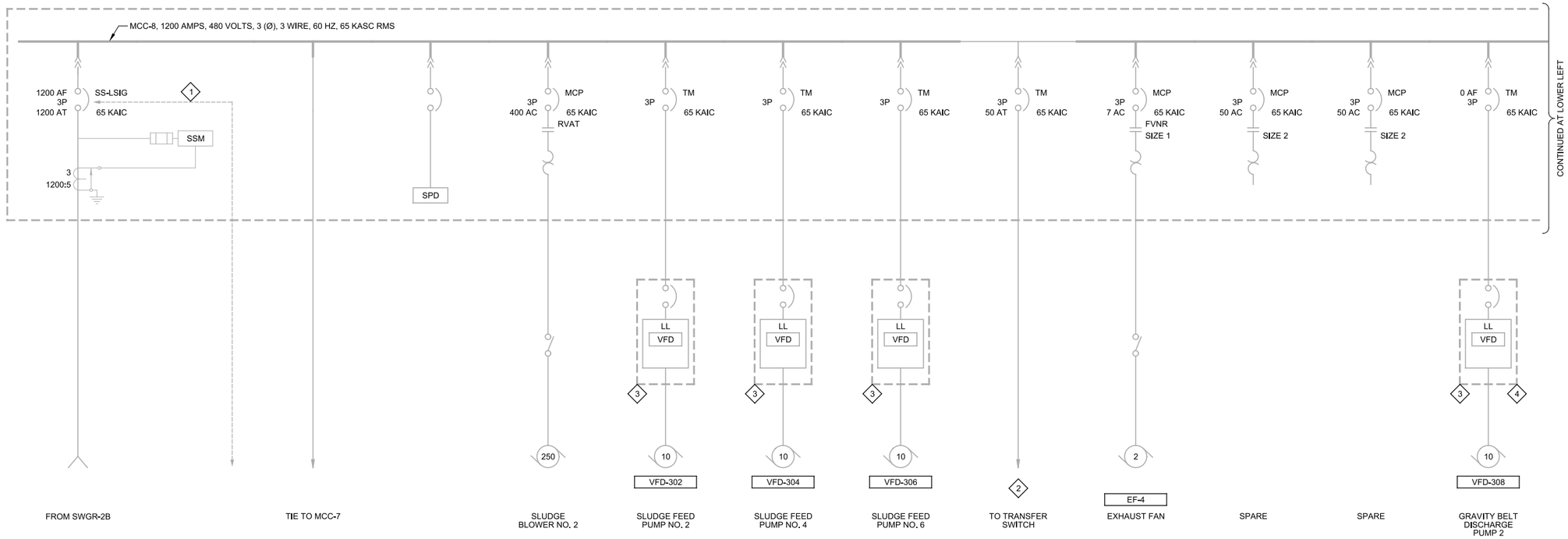
Request for Qualifications No. 24-TA005084SAM

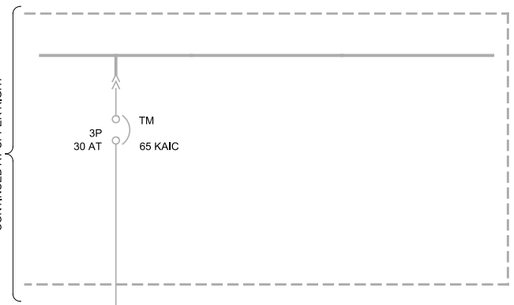
Manatee County FLORIDA

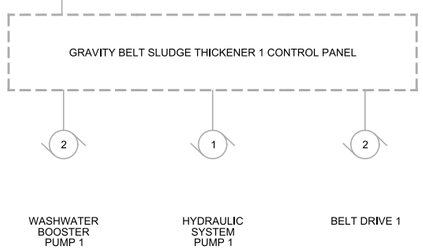
MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-7 ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E13
SHEET NO. 26 OF XX







KEY NOTES:

1. KIRK-KEY INTERLOCK TO MCC-7.
2. SEE SHEET 03E11.
3. INCLUDES BYPASS.
4. UNIT DV/DT FILTER.

APPENDIX A

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

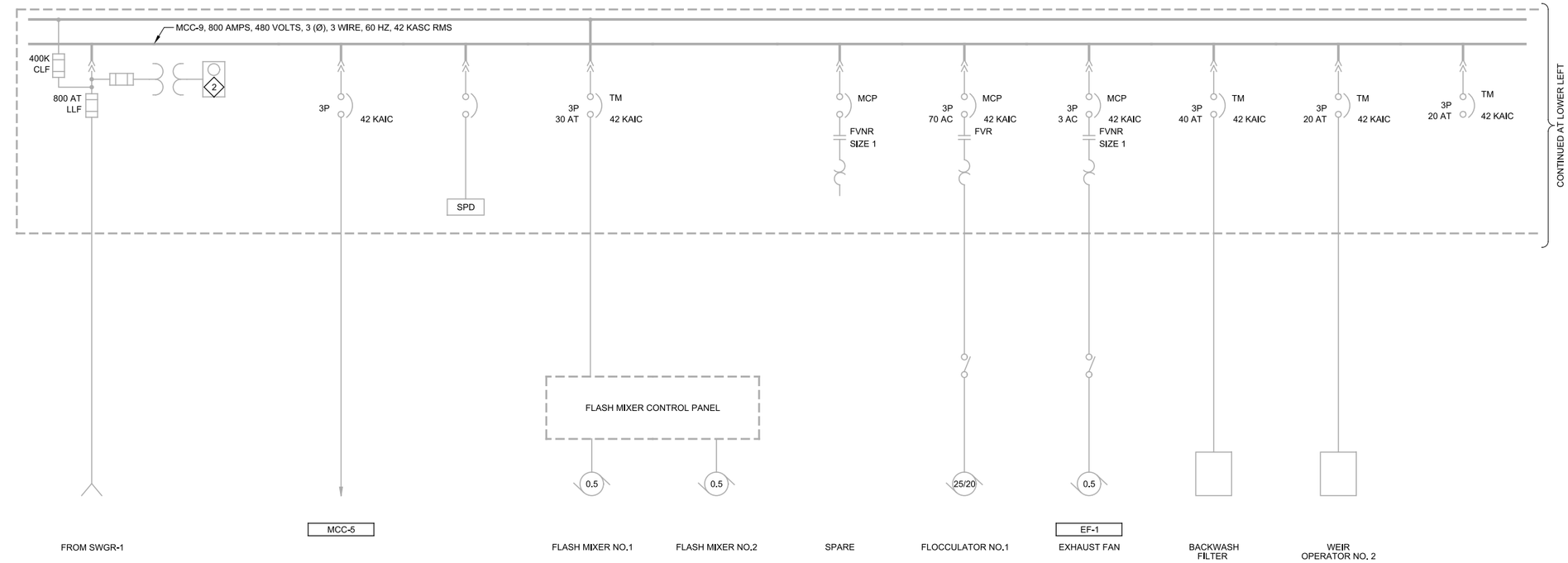
MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-8 ONE-LINE DIAGRAM

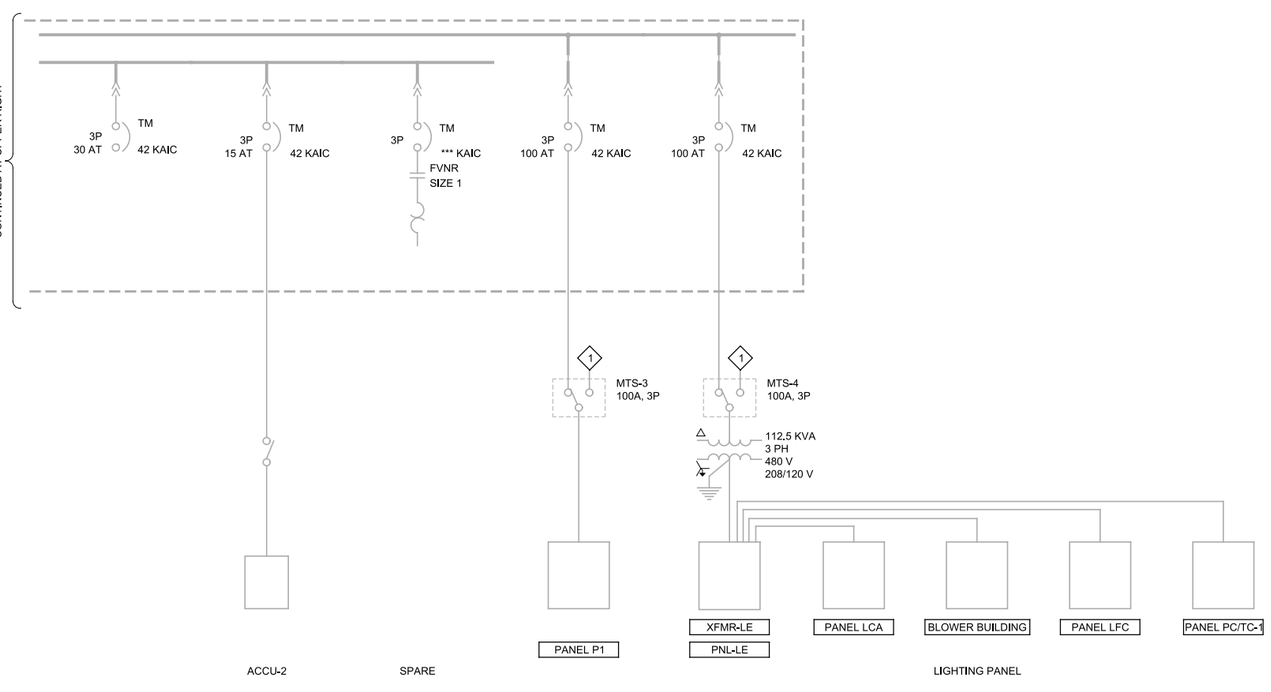
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E14
SHEET NO. 27 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E014.dgn

Plot Date: 27-DEC-2017 11:53:32 AM
User: bshepard
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: bshepard





KEY NOTES:

1. SUPPLY CURCUT FROM FEEDER BREAKER IN MCC-10, SEE 03E14.
2. ANALOG VOLT METER.

APPENDIX A

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

DESIGNED AHR
DRAWN TCD
CHECKED
DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-9 ONE-LINE DIAGRAM

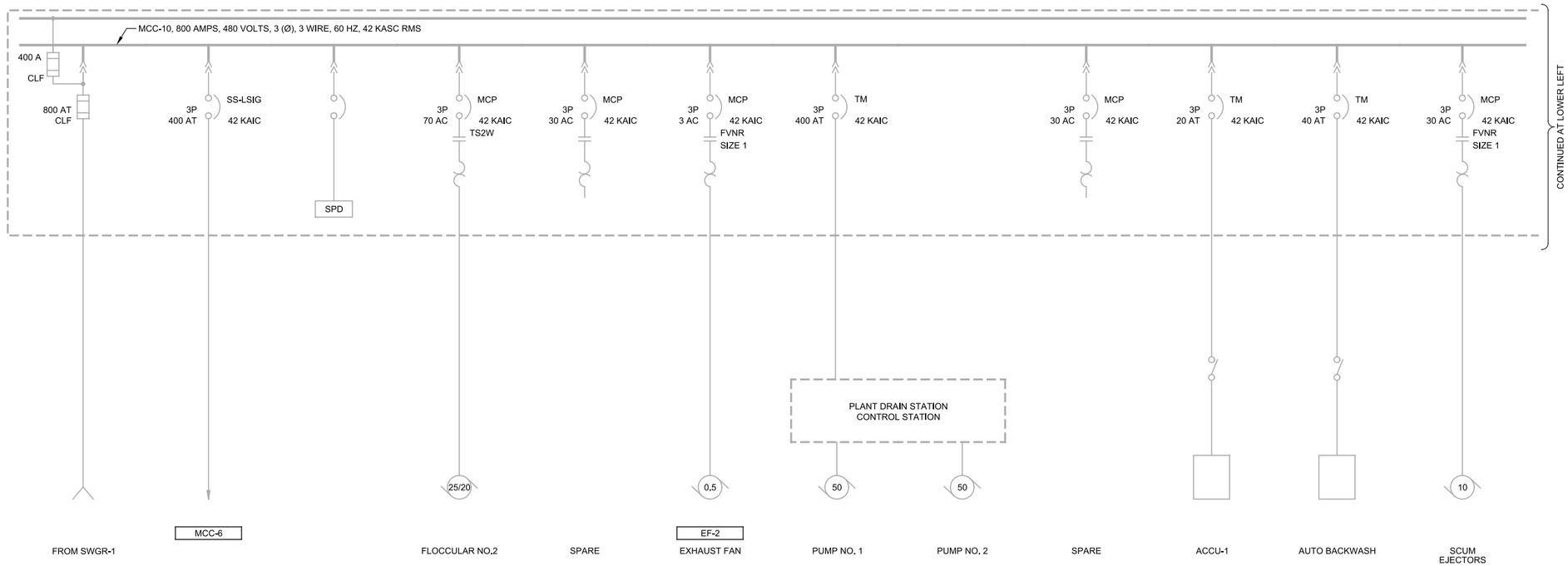
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E15
SHEET NO. 28 OF XX

Manatee County BCC

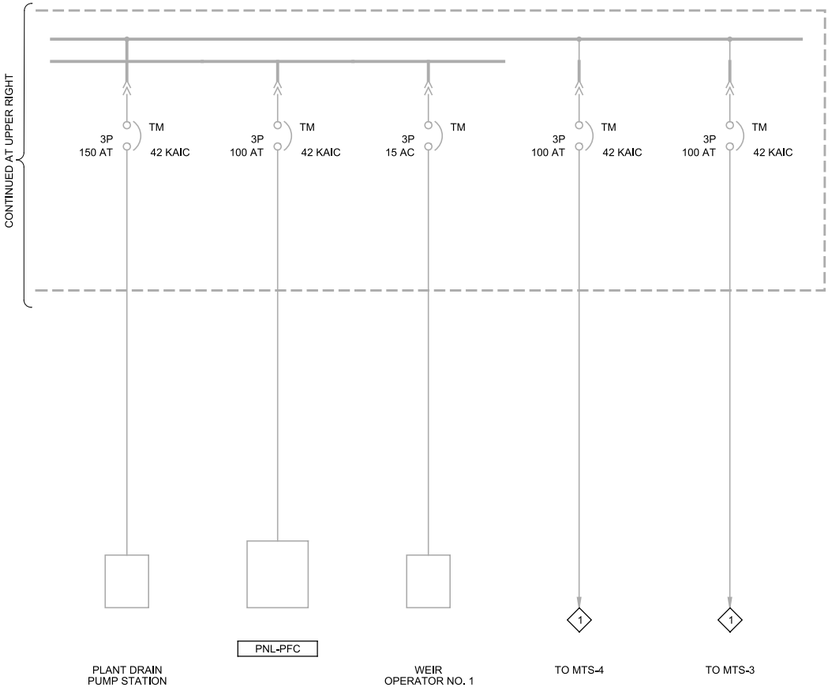
PROJECT NO. 10096N.00 FILE NAME: 10096N0003E015.dgn

Plot Date: 12-APR-2018 1:50:02 PM
User: lmorris
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1
LAST SAVED BY: lmorris



KEY NOTES:

1. TO MANUAL TRANSFER SWITCH, SEE SHEET 03E13.



APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

DESIGNED AHR
DRAWN SMB
CHECKED
DATE MAY 2017

carollo®

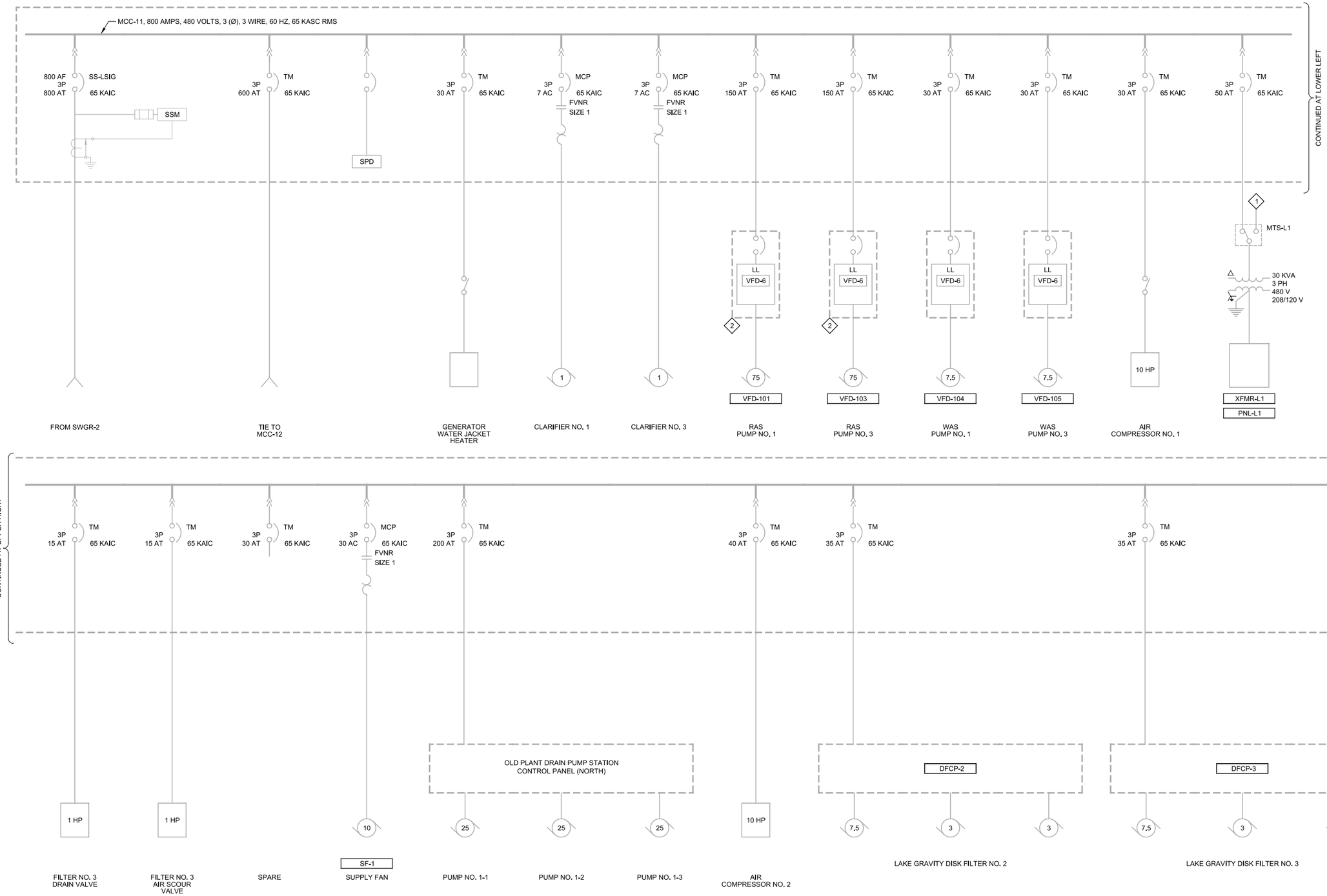
Request for Qualifications No. 24-TA005084SAM

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-10 ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E16
SHEET NO. 29 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E016.dgn
Plot Date: 12-APR-2018 2:11:20 PM
User: lmorris
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1
LAST SAVED BY: lshepard



APPENDIX A

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

Manatee County BCC

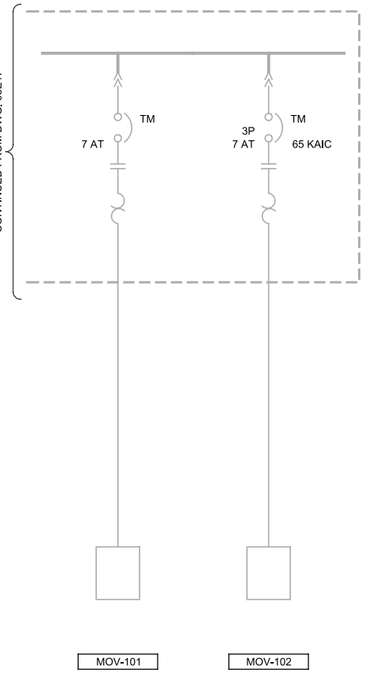
DESIGNED AHR
DRAWN SMB
CHECKED
DATE MAY 2017

Request for Qualifications No. 24-TA005084SAM

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-11 ONE-LINE DIAGRAM - I

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E17
SHEET NO. 30 OF XX



KEY NOTES:

1. FROM MCC-12. SEE SHEET 03E16.
2. INCLUDES BYPASS.

APPENDIX A

REV	DATE	BY	DESCRIPTION

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

Manatee County BCC

DESIGNED AHR
DRAWN SMB
CHECKED
DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-11A ONE-LINE DIAGRAM - II

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E18
SHEET NO. OF XX

MCC-12, 800 AMPS, 480 VOLTS, 3 (Ø), 3 WIRE, 60 HZ, 65 KASC RMS

CONTINUED AT LOWER LEFT

KEY NOTES:

1. TO MTS-C1, SEE SHEET 03E18.
2. INCLUDES BYPASS.

FROM SWGR-2	TIE TO MCC-11	CLARIFIER NO. 2	CLARIFIER NO. 4	RAS PUMP NO. 2	SPARE	WAS PUMP NO. 2	WAS PUMP NO. 4	SPARE
800 AF 3P 800 AT SS-LSIG 65 KAIC		3P 7 AC MCP 65 KAIC FVNR SIZE 1	3P 3 AC MCP 65 KAIC FVNR SIZE 1	150 AF 3P 150 AT TM 65 KAIC	3P 30 AC MCP 65 KAIC FVNR SIZE 2	3P 30 AT TM 65 KAIC	3P 30 AC MCP 65 KAIC	3P TM 65 KAIC
SSM; 3 800:5	SPD			LL VFD-6 (2)		LL VFD-6	LL VFD-6	
		1	1	75		7.5 VFD-105	7.5 VFD-107	

CONTINUED AT UPPER RIGHT

CONTINUED ONTO 03E20

FILTER NO. 3	FILTER NO. 4	AIR SCOUR BLOWER (FILTERS)	PUMP NO. 2-1	PUMP NO. 2-2	PUMP NO. 2-3	FILTER NO. 4 DRAIN VALVE	FILTER NO. 4 AIR SCOUR VALVE	SUPPLY FAN	EXHAUST FAN	BACKWASH PUMP STATION	LAKE GRAVITY DISK FILTER NO. 1
3P 60 AT TM 65 KAIC		3P 150 AC MCP 65 KAIC RVAT/B	3P 150 AT TM 65 KAIC			3P 15 AT TM 65 KAIC	3P 15 AT TM 65 KAIC	3P 30 AC MCP 65 KAIC FVNR SIZE 1	3P 7 AC MCP 65 KAIC FVNR SIZE 1	3P 35 AC TM	3P 35 AT TM 65 KAIC
FILTER CONTROL PANEL 3&4 (AUTO BACK WASH)			NEW PLANT DRAIN PUMP STATION CONTROL PANEL (SOUTH)							BPCP	DFCP-1
7.5	7.5	100	25	25	25	1 HP	1 HP	10 SF-2	2 EF-2	5	7.5
										5	3
											3

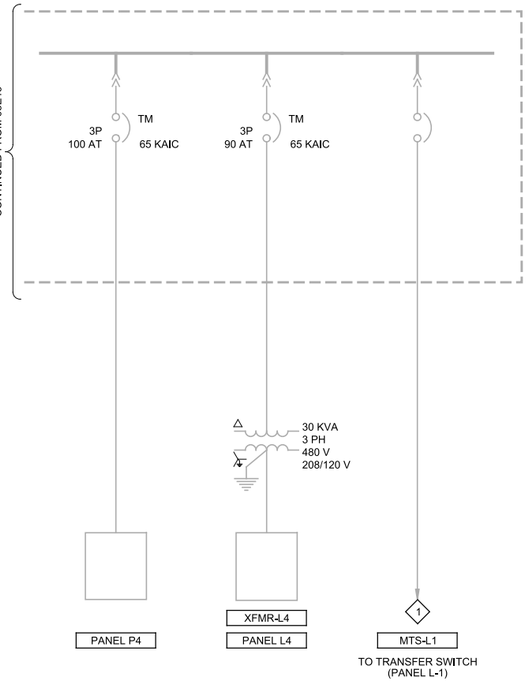
APPENDIX A

PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION	DESIGNED AHR	MANATEE COUNTY	JOB NO. 10096N.00
	DRAWN SMB	SEWRF ELECTRICAL MASTER PLAN	DRAWING NO. 03E19
	CHECKED	ELECTRICAL	SHEET NO. 22 OF XX
REV DATE BY DESCRIPTION	DATE MAY 2017	MCC-12 ONE-LINE DIAGRAM	VERIFY SCALES: BAR IS ONE INCH ON ORIGINAL DRAWING (0 — 1") IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

carollo

Request for Qualifications No. 24-TA005084SAM

Manatee County BCC



KEY NOTES:

1. TO MTS-C1, SEE SHEET 03E18.
2. INCLUDES BYPASS.

APPENDIX A

REV	DATE	BY	DESCRIPTION

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

Manatee County BCC

DESIGNED AHR
DRAWN SMB
CHECKED
DATE MAY 2017

carollo

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

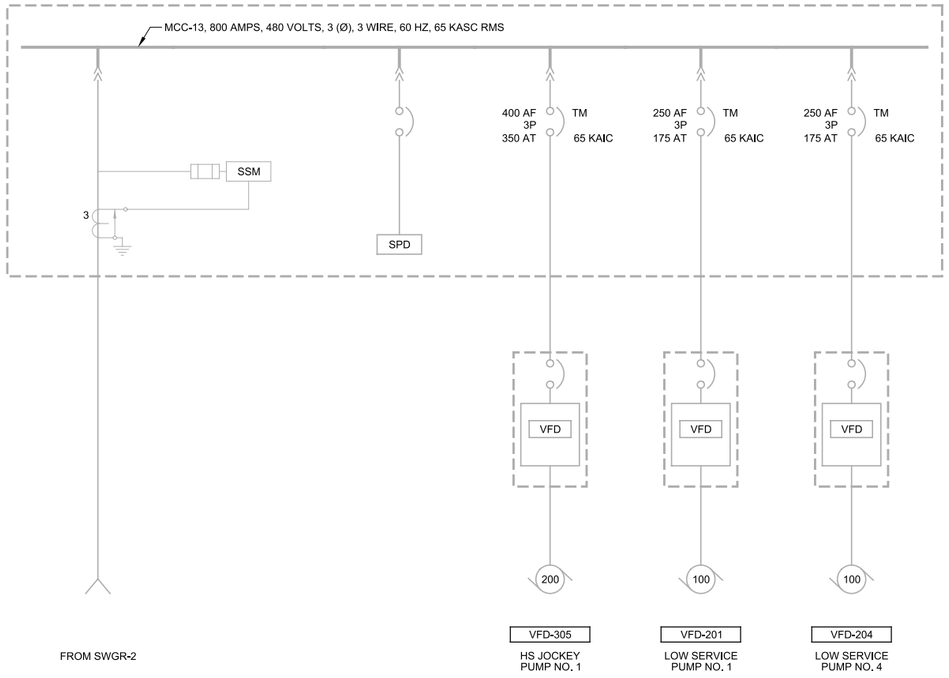
MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-12 ONE-LINE DIAGRAM - II

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E20
SHEET NO. 133 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E020.dgn

Plot Date: 27-DEC-2017 11:53:51 AM
User: bshepard
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1
LAST SAVED BY: bshepard



APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

Manatee County BCC

DESIGNED AHR | DRAWN SMB | CHECKED | DATE MAY 2017

carollo

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY

SEWRF ELECTRICAL MASTER PLAN

ELECTRICAL

MCC-13 ONE-LINE DIAGRAM

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

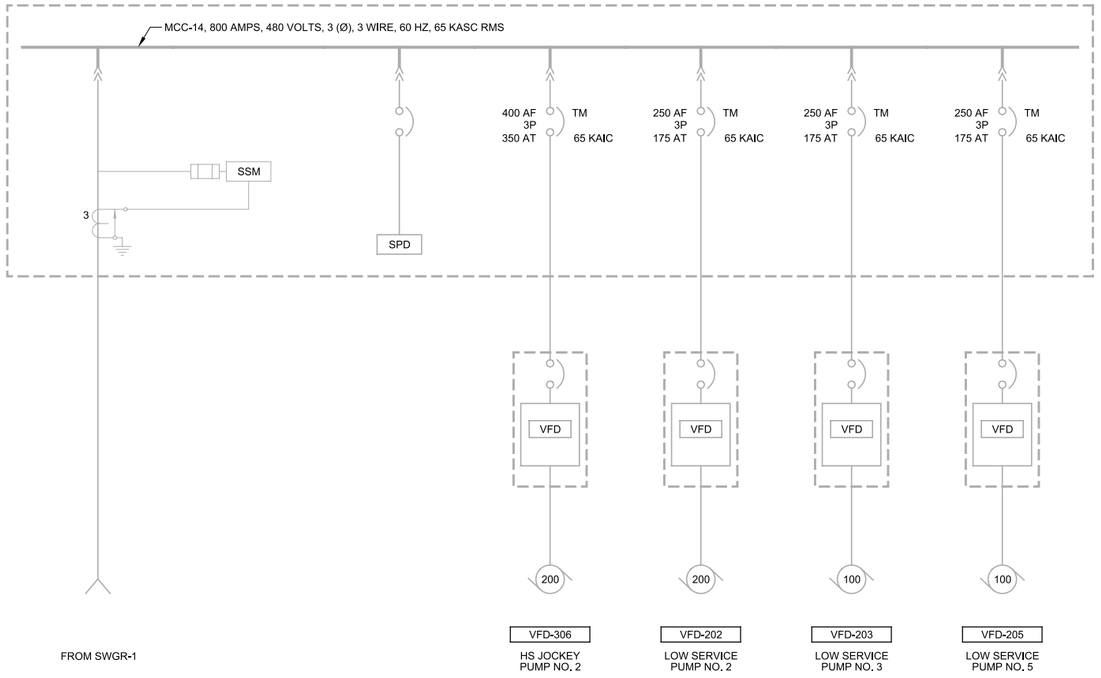
JOB NO. 10096N.00

DRAWING NO. 03E21

SHEET NO. 124 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E021.dgn

Plot Date: 27-DEC-2017 11:53:54 AM
User: bshepard
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1
LAST SAVED BY: bshepard



APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

Manatee County BCC

DESIGNED AHR
DRAWN SMB
CHECKED
DATE MAY 2017

carollo®

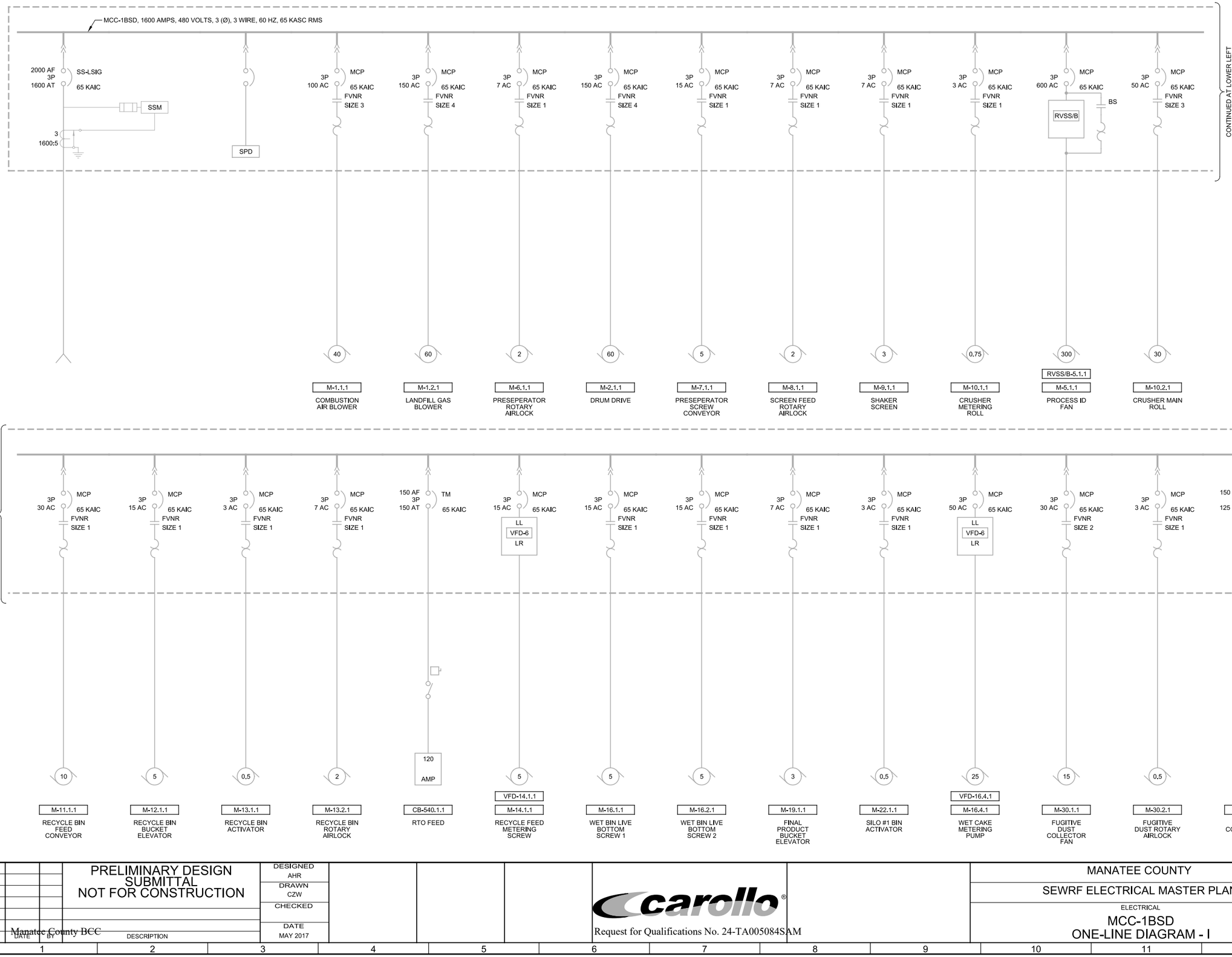
Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-14 ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E22
SHEET NO. 135 OF XX



APPENDIX A

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

DESIGNED AHR
DRAWN CZW
CHECKED
DATE MAY 2017

REV | DATE | BY | DESCRIPTION

Manatee County BCC

carollo

Request for Qualifications No. 24-TA005084SAM

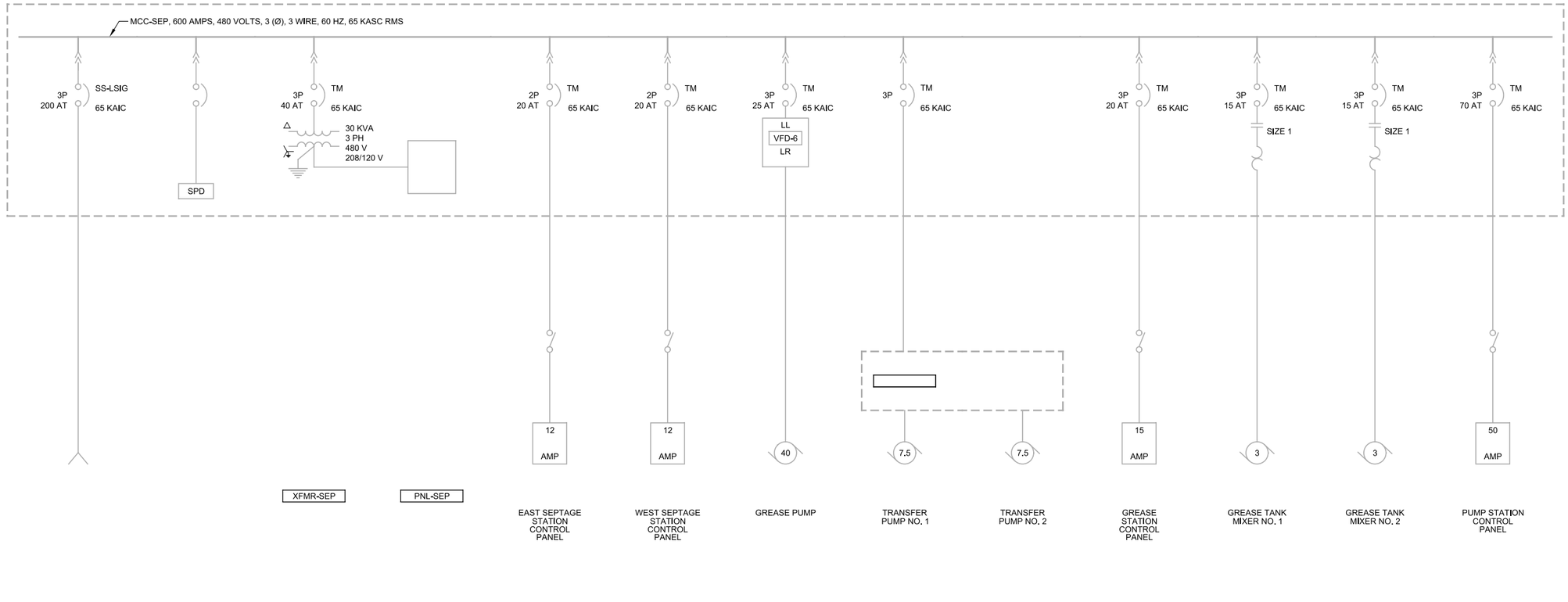
MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-1BSD
ONE-LINE DIAGRAM - I

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E23
SHEET NO. 26 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E023.dgn

Plot Date: 12-APR-2018 2:12:32 PM
User: lmorris
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1
LAST SAVED BY: bshepard



APPENDIX A

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

DESIGNED AHR
DRAWN SMB
CHECKED
DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
MCC-SEP ONE-LINE DIAGRAM

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. 03E24
SHEET NO. 37 OF XX

Manatee County BCC

PROJECT NO. 10096N.00 FILE NAME: 10096N0003E024.dgn

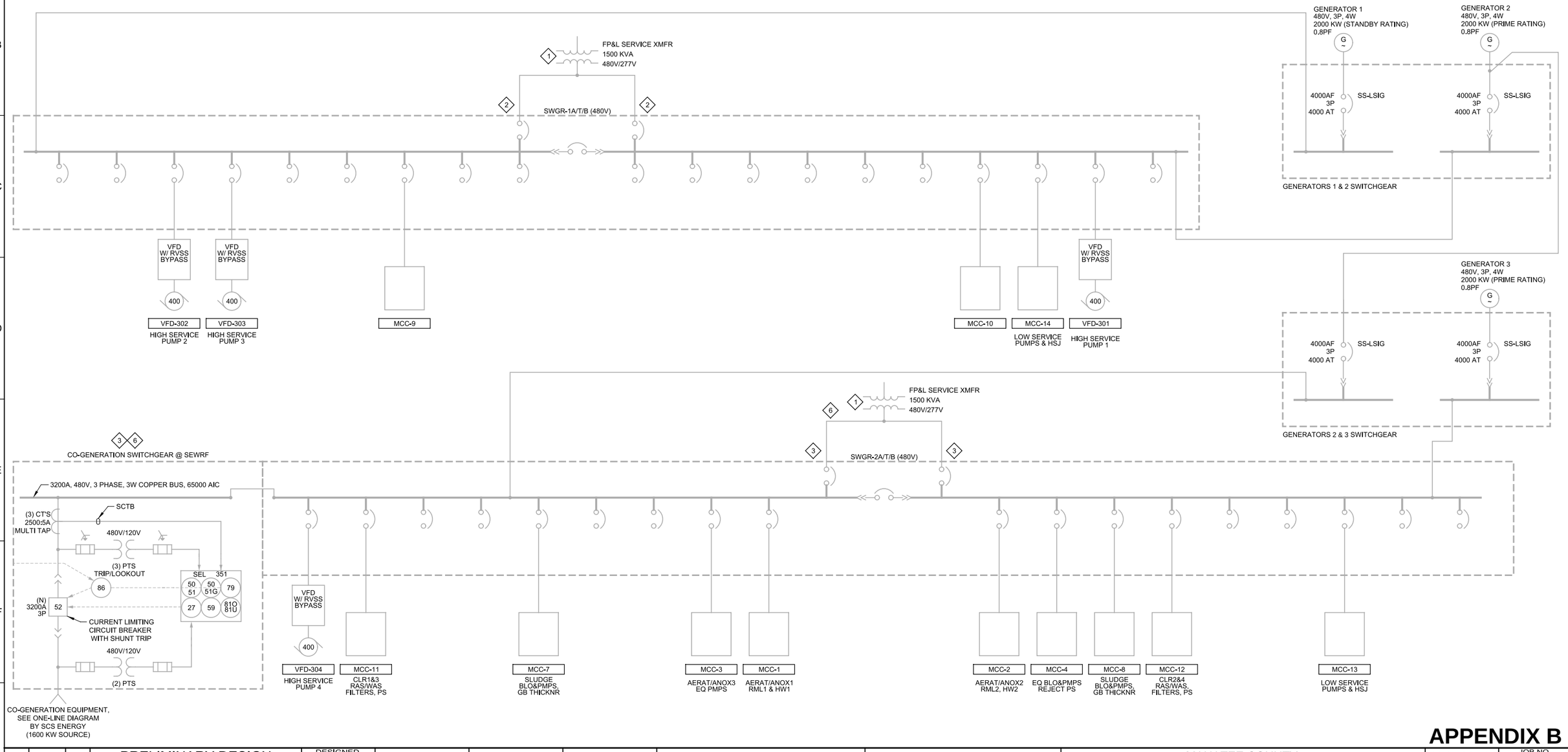
LAST SAVED BY: bshepard
Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1
Plot Date: 12-APR-2018 2:23:17 PM
User: lmorris

GENERAL NOTES:

1. THE CONSEQUENCE OF METERING PROBLEMS AT BOTH SWITCHGEARS IS THAT IT'S NOT POSSIBLE TO DETERMINE PLANT-WIDE DEMAND LOAD WITHOUT BETTER DATA FURTHER STUDY.
2. TRANSFORMER CAPACITY WOULD BE BETTER UTILIZED IF ONE SWITCHGEAR ASSEMBLY RECIVED ONE SERVICE FROM BOTH TRANSFORMERS.
3. GENERATOR CAPACITY WOULD BE BETTER UTILIZED OF ONE SWITCHGEAR ASSEMBLY WAS CAPABLE OF PARALLELING TWO OR THREE GENERATORS. AND IF THE GENERATOR SWITCHGEAR WERE CONNECTED TO THE SYSTEM AT A TRANSFER BUS FOR THE SERVICE SWITCHGEAR.
4. CO-GENERATION CAPACITY WOULD BE BETTER UTILIZED IF THE SYSTEM WAS SUPPLIED FROM ONE SERVICE SWITCHGEAR, RATHER THAN TWO.
5. TIES BETWEEN MCCS WOULD BE CONFER A GREATER BENEFIT (OF RELIABILITY) IF THE SYSTEM WAS SUPPLIED FROM ONE SERVICE SWITCHGEAR, RATHER THAN TWO.

KEY NOTES:

1. EACH SWITCHGEAR - AND THE LOADS IT SERVES - ARE ENTIRELY DEPENDENT ON ONE SERVICE TRANSFORMER FOR UTILITY POWER.
2. SWGR-1 HAS ONLY LIVE, ANALOG METERING, NO DIGITAL, HISTORICAL METERING.
3. SWGR-2 HAS A BROKEN METER ON SWGR-2B, THE CO-GENERATION SWITCHGEAR HAS NO VISIBLE METERING, AND THE METER ON SWGR-2A IS COMPLICATED BY PRESENCE OF CO-GENERATION.
4. SEWRF HAS 3000 KVA OF CAPACITY AT ITS UTILITY TRANSFORMERS AND 6000 KW OF CAPACITY ON IT'S BACKUP GENERATORS. ALSO, THE SWITCHING SEQUENCES FOR OPERATING THE BACKUP SYSTEM ARE COMPLICATED AND SPORADICALLY EXERCISED. A SINGLE ASSEMBLY OF GENERATOR SWITCHGEAR COULD ENABLE THE PLANT TO BACK UP IT'S PROCESS WITH 2 UNITS INSTEAD OF 3.
5. TIE BREAKERS BETWEEN DOWNSTREAM MOTOR CONTROL CENTERS (SUCH AS MCC-1 AND MCC-2) PROVIDE REDUNDANT FEEDER PATHS TO THESE TIED MOTOR CONTROL CENTERS, BUT STILL LEAVES THEM DEPENDANT ON THE SAME UTILITY TRANSFORMER.
6. WHEN POWER SUPPLIED BY CO-GENERATION IS NOT ENTIRELY CONSUMED AT SWGR-2, CO-GEN POWER IS SOLD TO FP&L - AND THEN BOUGHT AGAIN FROM FP&L AT SWGR-1.



APPENDIX B

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

DESIGNED	AHR
DRAWN	BLS
CHECKED	
DATE	MAY 2017

Manatee County BCC

carollo®
Request for Qualifications No. 24-TA005084SAM

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
OVERALL ONE-LINE DIAGRAM, 2018

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. EMP-2018
SHEET NO. 28 OF XX

FP&L FEEDER, 22.86 KV

GENERATOR 1
480V, 3P, 4W
2000 KW (STANDBY RATING)
0.8PF

GENERATOR 2
480V, 3P, 4W
1825 KW (STANDBY RATING)
0.8PF

GENERATOR 3
480V, 3P, 4W
2000 KW (STANDBY RATING)
0.8PF

3

SWGR-GEN (480V)

4000AF 3P 4000 AT SS-LSIG

4000 AMPS, 480 VOLTS, 3 (Ø), 3 WIRE, 60 HZ, 65 KASC RMS

4000 AT 3P 4000 AF SS-LSIG

FP&L SERVICE XMFR
1500 KVA
480V/277V
1

2

SWGR-1A/T/B (480V)

VFD W/ RVSS BYPASS
400
VFD-302
HIGH SERVICE PUMP 2

VFD W/ RVSS BYPASS
400
VFD-303
HIGH SERVICE PUMP 3

MCC-9

MCC-10

MCC-14
LOW SERVICE PUMPS & HSJ

VFD W/ RVSS BYPASS
400
VFD-301
HIGH SERVICE PUMP 1

4
CO-GENERATION SWITCHGEAR @ SEWRF

3200A, 480V, 3 PHASE, 3W COPPER BUS, 65000 AIC

(3) CT'S 2500:5A MULTI TAP
SCTB
480V/120V
(3) PTS
TRIP/LOOKOUT
86
SEL 351
50 51
50 51G
79
27
59
81O 81U
(N) 3200A 3P
52
CURRENT LIMITING CIRCUIT BREAKER WITH SHUNT TRIP
480V/120V
(2) PTS

CO-GENERATION EQUIPMENT, SEE ONE-LINE DIAGRAM BY SCS ENERGY (1600 KW SOURCE)

SWGR-2A/B (480V)

VFD W/ RVSS BYPASS
400
VFD-304
HIGH SERVICE PUMP 4

MCC-11
CLR1&3 RAS/WAS FILTERS, PS

MCC-5
SOLIDS HANDLING

MCC-7
SLUDGE BLO&PMPS, GB THICKNR

MCC-3
AERAT/ANOX3 EQ PMPS

MCC-1
AERAT/ANOX1 RML1 & HW1

MCC-2
AERAT/ANOX2 RML2, HW2

MCC-4
EQ BLO&PMPS REJECT PS

MCC-8
SLUDGE BLO&PMPS, GB THICKNR

MCC-12
CLR2&4 RAS/WAS, FILTERS, PS

MCC-6
SOLIDS HANDLING

MCC-13
LOW SERVICE PUMPS & HSJ

KEY NOTES:

1. WHEN REPLACING SWGR-1A/B WITH NEW LOW VOLTAGE SWITCHGEAR, RECONFIGURE THE SERVICE CONDUCTORS FROM FP&L TRANSFORMERS, SO THAT ONE FP&L TRANSFORMER IS DEDICATED TO ONE SWITCHGEAR FEEDER BUS. WITH PROCESS LOADS DIVERSIFIED ACROSS THE TWO FEEDER BUSES, DEDICATING THE TRANSFORMERS PROVIDES MORE FLEXIBILITY AND RESILIENCY TO OUTAGES.
2. PROVIDE SWGR-1A/B WITH MAIN CIRCUIT BREAKERS, FEEDERS, AND TIES FOR 2019 REPLACEMENT, BUT LEAVE SPACE TO EXPAND WITH FUTURE FEEDER SECTIONS, AS SHOWN IN DRAWING EMP-2031.
3. WHEN THE OLD SWGR-1A/B IS REPLACED, THE INTEGRATION OF CONTROL BETWEEN GENERATOR 1 AND BUS A (OF SWGR-1A/B) AND BETWEEN GENERATOR 2 AND BUS B (OF SWGR-1A/B) WILL BE LOST. ALSO, THE EXISTING ARRANGEMENT, WHERE THREE GENERATORS ARE UNABLE TO PARALLEL WITH ONE ANOTHER - AND EACH HAVE A (MOSTLY) DISTINCT JURISDICTION FROM THE REST - IS CONFUSING, DIFFICULT TO USE, AND POORLY UTILIZES THE SEWRF'S SIGNIFICANT INVESTMENT IN BACKUP CAPABILITY. CONSIDERING THIS, CAROLLO RECOMMENDS REPLACING TWO SEPARATE ASSEMBLIES (THAT HAVE 4 SEPARATE GENERATOR BUSES FOR 3 GENERATORS) WITH NEW GENERATOR SWITCHGEAR THAT IS CAPABLE OF PARALLELING THE PLANT'S BACKUP SOURCES - AND MAKES THEM AVAILABLE TO ALL OF ITS LOAD.
4. IN THE EXISTING ARRANGEMENT, THE CO-GENERATION INPUT TO BUS SWGR-2A CONTRIBUTES TO HIGH AVAILABLE FAULT CURRENT, AND IT'S UNCLEAR HOW THE PROTECTION IS COORDINATED TO ENSURE THAT THE BUS OPERATES WITHIN IT'S RATING OF 3200 A. CAROLLO RECOMMENDS THAT THE PROTECTION OF SWGR-2A/B IS RE-EVALUATED WHEN IT'S SUPPLY CIRCUIT IS RE-CONFIGURED TO COME FROM SWGR-1A/B. WHEN DOING SO, THE METERING AND PROTECTION SOLUTIONS SHOULD ACCOUNT FOR THE DIRECTIONAL FLOW OF POWER THROUGH THE MAIN AND TIE CIRCUIT BREAKERS OF SWGR-2A/B.

APPENDIX C

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

DESIGNED AHR
DRAWN BLS
CHECKED
DATE MAY 2017

Manatee County BCC

carollo®
Request for Qualifications No. 24-TA005084SAM

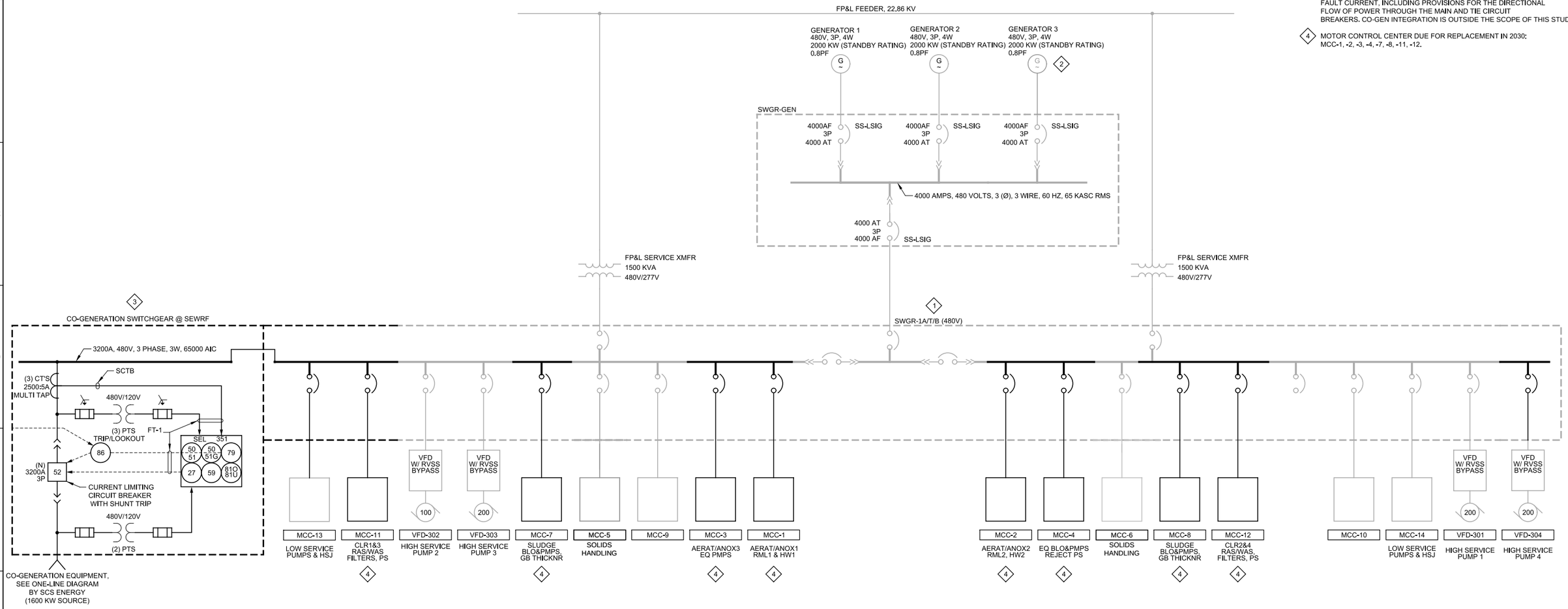
MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
OVERALL ONE-LINE DIAGRAM, 2019

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. EMP-2019
SHEET NO. 29 OF XX

KEY NOTES:

1. IF THE COUNTY PREFERS TO HAVE ONE SWITCHGEAR ASSEMBLY RATHER THAN 2, THEN THE CONFIGURATION WOULD LOOK LIKE THIS, WITH MCCS SUPPLIED DIRECTLY FROM SWGR-1A/T/B. CAROLLO RECOMMENDS MAINTAINING THE SERVICE ENTRANCE SWITCHGEAR SEPARATE FROM THE DISTRIBUTION SWITCHGEAR, AS SHOWN IN EMP-2019 AND EMP-2035.
2. GENERATOR 3 IS SHOWN DECOMISSIONED, BUT LEFT IN PLACE FOR SPARE PARTS. IT COULD ALSO BE REMOVED ENTIRELY.
3. CO-GENERATION SWITCHGEAR WILL HAVE TO BE TRANFERRED TO NEW SOURCE (AND PROBABLY REPLACED) WHEN SWGR-2A/B IS RETIRED. IF ATTACHED TO SWGR-1A/B, THE DESIGN OF THAT INSTALLATION WILL HAVE TO ADDRESS THE PROTECTION OF SWGR-2A/B WITHIN ITS RATINGS FOR NORMAL OPERATION AND FAULT CURRENT, INCLUDING PROVISIONS FOR THE DIRECTIONAL FLOW OF POWER THROUGH THE MAIN AND TIE CIRCUIT BREAKERS. CO-GEN INTEGRATION IS OUTSIDE THE SCOPE OF THIS STUDY.
4. MOTOR CONTROL CENTER DUE FOR REPLACEMENT IN 2030: MCC-1, -2, -3, -4, -7, -8, -11, -12.



APPENDIX D

REV	DATE	BY	DESCRIPTION
			PRELIMINARY DESIGN SUBMITTAL NOT FOR CONSTRUCTION

Manatee County BCC

DESIGNED AHR
DRAWN BLS
CHECKED
DATE MAY 2017

carollo®

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
OVERALL ONE-LINE DIAGRAM, 2031

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. EMP-2031
SHEET NO. 140 OF XX

PROJECT NO. 10096N.00 FILE NAME: 10096N00EMP-2031.dgn

FP&L FEEDER, 22.86 KV

GENERATOR 1 (1)
480V, 3P, 4W
2000 KW (STANDBY RATING)
0.8PF

GENERATOR 2
480V, 3P, 4W
2000 KW (STANDBY RATING)
0.8PF

GENERATOR 3
480V, 3P, 4W
2000 KW (STANDBY RATING)
0.8PF

SWGR-GEN

4000AF 3P 4000 AT — SS-LSIG

4000 AMPS, 480 VOLTS, 3 (Ø), 3 WIRE, 60 HZ, 65 KASC RMS

4000 AT 3P 4000 AF — SS-LSIG

FP&L SERVICE XMFR
1500 KVA
480V/277V

FP&L SERVICE XMFR
1500 KVA
480V/277V

SWGR-1A/B (480V)

VFD W/ RVSS BYPASS — 400 — VFD-302 — HIGH SERVICE PUMP 2

VFD W/ RVSS BYPASS — 400 — VFD-303 — HIGH SERVICE PUMP 3

MCC-9

MCC-10

MCC-14 — LOW SERVICE PUMPS & HSJ

VFD W/ RVSS BYPASS — 400 — VFD-301 — HIGH SERVICE PUMP 1

CO-GENERATION SWITCHGEAR @ SEWRF

3200A, 480V, 3 PHASE, 3W COPPER BUS, 65000 AIC

(3) CT'S 2500:5A MULTI TAP

SCTB

480V/120V

(3) PTS TRIP/LOOKOUT

86

SEL 351

50 51 — 50 51G — 79

27 — 59 — 81O 81U

(N) 3200A 3P 52

CURRENT LIMITING CIRCUIT BREAKER WITH SHUNT TRIP

480V/120V

(2) PTS

CO-GENERATION EQUIPMENT, SEE ONE-LINE DIAGRAM BY SCS ENERGY (1600 KW SOURCE)

(2)

SWGR-2A/B (480V)

VFD W/ RVSS BYPASS — 400 — VFD-304 — HIGH SERVICE PUMP 4

MCC-11 — CLR1&3 RAS/WAS FILTERS, PS

MCC-5 — SOLIDS HANDLING

MCC-7 — SLUDGE BLO&PMPS, GB THICKNR

MCC-3 — AERAT/ANOX3 EQ PMPS

MCC-1 — AERAT/ANOX1 RML1 & HW1

MCC-2 — AERAT/ANOX2 RML2, HW2

MCC-4 — EQ BLO&PMPS REJECT PS

MCC-6 — SOLIDS HANDLING

MCC-8 — SLUDGE BLO&PMPS, GB THICKNR

MCC-12 — CLR2&4 RAS/WAS, FILTERS, PS

MCC-13 — LOW SERVICE PUMPS & HSJ

KEY NOTES:

(1) WITH DILIGENT MAINTENANCE AND EXERCISE, THE COUNTY CAN EXPECT TO GET 40-50 YEARS FROM EACH OF ITS GENERATORS THAT WERE BUILT IN 1995 (GENERATORS 1 & 2).

(2) DRAWING EMP-2031 ILLUSTRATED THE OPTION FOR ELIMINATING SWGR-2A/B WHEN IT'S DUE FOR REMOVAL IN 2031. THIS DRAWING ILLUSTRATES THE OPTION OF REPLACING SWGR-2A/B WITH A SIMILAR UNIT TO RETAIN THE CONFIGURATION INTRODUCED IN EMP-2019: TO HAVE A DISTRIBUTION BUS THAT IS DOWNSTREAM FROM THE SERVICE ENTRANCE SWITCHGEAR. THE OPTION REFLECTED HERE MATCHES THE COST ESTIMATE FIGURES OF THE ELECTRICAL MASTER PLAN.

(3) GENERATOR 3 IS SHOWN DECOMMISSIONED, BUT LEFT IN-PLACE FOR SPARE PARTS. IT COULD ALSO BE REMOVED ENTIRELY.

APPENDIX E

PRELIMINARY DESIGN SUBMITTAL
NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

DESIGNED AHR
DRAWN BLS
CHECKED
DATE MAY 2017

carollo

Request for Qualifications No. 24-TA005084SAM

Manatee County FLORIDA

MANATEE COUNTY
SEWRF ELECTRICAL MASTER PLAN
ELECTRICAL
OVERALL ONE-LINE DIAGRAM, 2035

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 — 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10096N.00
DRAWING NO. EMP-2035
SHEET NO. 41 OF XX

Manatee County BCC

PROJECT NO. 10096N.00 FILE NAME: 10096N00EMP-2025.dgn

Manatee County Wastewater Treatment Facility

Equipment Numbering Convention

Prepared by Andrew Rex (file name - EQUIP_ID.XLS)

September 16, 1997 Updated: 6/9/2010

APPENDIX F: Area Tags & Equipment Codes

Process / Area Numbering

Process / Area Code Number*	Process Area / Type
01	IBM Lift Station
11	Headworks / Septage Handling
12	Primary Lift Pumping Station
21	Primary Clarifiers
22	Primary Sludge Pumping Area
23	PST 4 Sludge Pumping Station
24	Gravity Thickeners / Sludge Transfer Room
25	Digester Complex
26	Resource Recovery Complex
27	Equalization Basin / Odor Treatment Complex #2
28	Co-Generation Complex
29	Biosolids De-watering Area
30	Biosolids Cake Processing Area
31	Secondary Pump Station
33	Aeration Basins
34	Blower Building
35	Odor Treatment Complex #1
~~41~~	~~Interstage Pump Station (To be De-commissioned)~~
42	Solids Contact Tanks
51	Secondary Clarifiers
52	Solids Contact Pump Gallery
53	Solids Contact MCC Room
61	NTF Pumping Station
62	NTF Other Equipment
63	Dissolved Air Flotation Thickening Complex
71	Chlorine Storage / Feed
72	So2 Storage / Feed
73	Chlorine Contact Basin
74	Nonpotable Water Pumping Station
75	Sodium Hypochlorite (at Non-Pot building)
76	UV Disinfection (Future)
81	Laboratory
82	Existing Administration Building
91	Ops Center / Filter Building Upper Level
92	Filter Building Lower Level

Equipment Prefix List

The following letters will precede the Process Area Code found to the left.

Prefix	Equipment Type	Prefix	Equipment Type
AC(U)	AIR CONDITIONER (UNIT)	HUM	HUMIDIFIER
ACF	ACTIVE COMPOST FAN	LI	LEVEL INDICATOR
ACP	AIR COMPRESSOR	LP	LIGHTING PANEL / LOCAL PANEL
AHU	AIR HANDLING UNIT	LP	LIGHTING PANEL / LOCAL PANEL
AI	MISC. ANALYSIS INDICATOR	LS	LIMIT SWITCH
ANE	ANALYSIS EQUIP. (Detectors and Analyzers)	M	MOTOR
AV	MOTOR OPERATED DAMPER	MCC	MOTOR CONTROL CENTER
B	BOILER	MME	MISC. MECHANICAL EQUIPMENT
BF	BIOFILTER	MUA	MAKE-UP AIR UNIT
BLR	AERATION BLOWER	MXR	MIXER / AGITATOR
BS	BAR SCREEN	PCL	PRIMARY CLARIFIER
CAP	CAPACITOR	PDP	POSITIVE DISPLACEMENT PUMP (Lobe, Piston)
CC	CONTACTOR CABINET	PFE	MISC. POLYMER FEED EQUIPMENT
CCF	COMPOST CURING FAN	PI	PRESSURE INDICATOR
CDR	CONDENSER	PNL	PANEL
CEN	CENTRIFUGE	PP	POWER PANEL (ELECTRIC)
CP	CENTRIFUGAL PUMP	PRV	POWER ROOF VENTILATOR
CV	CONTROL VALVE	PV	PRESSURE REGULATING OR RELIEF VALVE
CVR	CONVEYOR	PVL	PRESSURE VESSEL
DG	DRAIN GATE	SBR	AIR SCRUBBER
DGE	MISC. DIGESTER GAS EQUIPMENT	SC	SPEED CONTROLLER
DP	DISTRIBUTION PANEL (ELECTRIC)	SCL	SECONDARY CLARIFIER
ES	EMERGENCY STOP SWITCH	SCR	SCREEN
EF	EXHAUST FAN	SG	SLIDE GATE
F	FAN	SLG	SLUICE GATE
FAF	FOUL AIR FAN	SLP	SCREW LIFT PUMP
FI	FLOW INDICATOR	SP	SUMP PUMP
FLT	FILTER	SPR	SPARE (Misc.)
GCP	GAS COMPRESSOR	SV	SOLENOID VALVE
GDR	GRINDER	T	MISC. TANK / BASIN
GEN	GENERATOR	UH	UNIT HEATER
H	OVERHEAD MONORAIL HOIST	V	VALVE
HX	HEAT EXCHANGER	VLP	VERTICAL LIFT PUMP
HE	MISC. HEADWORKS EQUIPMENT	VRV	VACUUM REGULATOR
HRU	HEAT RECOVERY UNIT	WI	WEIGHT INDICATOR

* This two digit prefix will be followed by another two digits, starting at #01, and will increment by one until a series of three or more pieces of equipment are en-countered. Then the decade number will increment to the next unused series. For example, CP7401 and CP7402 would identify centrifugal pumps in the Non-pot Pumping Station. CP7411, CP7412, and CP7413 would identify three other types of centrifugal pumps there as well. Beginning with the Liquid Stream Improvements and De-watering Facility upgrades, this numbering scheme will be increased to a 5 digit number, 2 for the process area and 3 to identify equipment using the same instructions previuosly stated.

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT	[redacted]
CLIENT	
PROJECT NUMBER	
REPORT BY	ANDREW REX
REPORT DATE	5/24/2017 6:30 PM

03 | MAINTENANCE BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
	SHOP AIR COMPRESSOR	43_11_52	NEW	DUTY	CONSTANT SPEED	52.5	HP	480	3	PB-85-01	N	Indoor
	BRIDGE CRANE (TRUCK BAY)		NEW	STANDBY	CONSTANT SPEED	10.0	HP	480	3	PB-85-02	N	Indoor
BMS-03.900	MAINTENANCE BUILDING BMS CONTROL PANEL		NEW	DUTY		20.0	AMP	120	1	LP-85-02	N	Indoor
EF-03.920B	MAINTENANCE BAY EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.3	HP	120	1	LP-85-01	N	Indoor
General Comments:	*1,000 CFM*											
EF-03.921	LOWER LEVEL STORAGE EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.5	HP	120	1	LP-85-01	N	Indoor
General Comments:	*2,000 CFM*											
EF-03.922	TOOL STORAGE EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.5	HP	120	1	LP-85-01	N	Indoor
General Comments:	*1,500 CFM*											
EF-03.923	OIL STORAGE EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.5	HP	120	1	LP-85-01	N	Indoor
General Comments:	*1,500 CFM*											
EF-03.924	UPPER LEVEL STORAGE EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.5	HP	120	1	LP-85-01	N	Indoor
EF-03.925	JANITORIAL CLOSET EXHAUST FAN	23_34_01	NEW	DUTY		0.0	KW	120	1	LP-85-01	N	Indoor
General Comments:	*50 CFM*											
EF-03.926	SHOWER EXHAUST FAN	23_34_01	NEW	DUTY		0.0	KW	120	1	LP-85-01	N	Indoor
General Comments:	*50 CFM*											
EF-03.927	MEN'S RESTROOM EXHAUST FAN	23_34_01	NEW	DUTY		0.1	KW	120	1	LP-85-01	N	Indoor
General Comments:	*50 CFM*											
EF-03.928	WOMEN'S RESTROOM EXHAUST FAN	23_34_01	NEW	DUTY		0.1	KW	120	1	LP-85-01	N	Indoor
General Comments:	*50 CFM*											
EF-03.929	LOCKER ROOM EXHAUST FAN	23_34_01	NEW	DUTY		0.1	KW	120	1	LP-85-01	N	Indoor
General Comments:	*150 CFM*											
EUH-03.956	OIL STORAGE ELECTRIC UNIT HEATER	23_83_01	NEW	DUTY		11.0	AMP	480	1	PB-85-01	N	Indoor
GUH-03.951	MAINTENANCE ROOM GAS INFRA-RED TUBE HEATER	23_83_01	NEW	DUTY		5.5	AMP	120	1	LP-85-02	N	Indoor
GUH-03.952	MAINTENANCE ROOM GAS INFRA-RED TUBE HEATER	23_83_01	NEW	DUTY		5.5	AMP	120	1	LP-85-02	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

03 | MAINTENANCE BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
GUH-03.953	LOWER LEVEL STORAGE GAS UNIT HEATER	23_83_01	NEW	DUTY		1.9	AMP	120	1	LP-85-02	N	Indoor
GUH-03.954	TOOL STORAGE GAS UNIT HEATER	23_83_01	NEW	DUTY		1.9	AMP	120	1	LP-85-02	N	Indoor
GUH-03.955	UPPER PARTS STORAGE	23_83_01	NEW	DUTY		2.4	AMP	120	1	LP-85-02	N	Indoor
GWH-03.011	GAS WATER HEATER	22_42_01	NEW	DUTY		2.2	AMP	120	1	LP-85-02	N	Indoor
PWU-03.XXX1	SHOP PRESSURE WASHER UNIT	46_21_93	NEW	DUTY	CONSTANT SPEED	15.0	HP	480	3	PB-85-02	N	Indoor
TPV-03.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-85-01	N	Indoor
TPV-03.002	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-85-01	N	Indoor
	ROLLUP DOOR 03A (WEST)		NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	PB-85-02	N	Indoor
General Comments:	*ETAP TAG RUD-81.01*											
	ROLLUP DOOR 03B (EAST)		NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	PB-85-02	N	Indoor
General Comments:	*ETAP TAG RUD-81.01*											
HP-03.941	HEAT PUMP	23_81_44	NEW	DUTY		15.5	AMP	480	3	PB-85-01	N	Indoor
VCP-03.960	WATER PUMP FOR HEAT PUMP	23_21_23	NEW	DUTY	VARIABLE SPEED	7.4	AMP	480	3	PB-85-01	N	Indoor
EF-03.920A	MAINTENANCE BAY EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-85	N	Indoor
General Comments:	*9,000 CFM*											
SF-03.931	MAINTENANCE BAY SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	Indoor
SF-03.932	MAINTENANCE BAY SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	MCC-85	N	Indoor
General Comments:	*3,000 CFM*											

04 | ADMIN BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
ADMIN-MISC	MISCELLANEOUS LOADS IN ADMIN BUILDING		NEW	DUTY		600.0	AMP	480	3	SWB-04	Y	Indoor

10 | NEW LIFT STATION

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
	BRIDGE CRANE (MEZZANINE)		NEW	DUTY	CONSTANT SPEED	10.0	HP	480	3	PB-10-01	N	Indoor
	MONORAIL (PUMP ROOM)		NEW	STANDBY	CONSTANT SPEED	7.5	HP	480	3	PB-10-01	N	Indoor
	MONORAIL (GRADE LEVEL)		NEW	STANDBY	CONSTANT SPEED	7.5	HP	480	3	PB-10-01	N	Indoor
BMS-10.900	CC LIFT STATION BMS CONTROL PANEL		NEW	DUTY		20.0	AMP	120	1	LP-10-01	N	Indoor
EDR-10.111	SCREEN CHANNEL 1 INFLUENT GATE		NEW	DUTY		3.0	HP	480	3	PB-10-03	N	Indoor
EDR-10.119	SCREEN CHANNEL 1 EFFLUENT GATE		NEW	DUTY		3.0	HP	480	3	PB-10-03	N	Indoor
EDR-10.121	SCREEN CHANNEL 2 INFLUENT GATE		NEW	STANDBY		3.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.129	SCREEN CHANNEL 2 EFFLUENT GATE		NEW	STANDBY		3.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.131	SCREEN CHANNEL 3 INFLUENT GATE		NEW	STANDBY		3.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.139	SCREEN CHANNEL 3 EFFLUENT GATE		NEW	STANDBY		3.0	HP	480	3	PB-10-02	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

10 | NEW LIFT STATION

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDR-10.141	BYPASS GATE 1		NEW	STANDBY	CONSTANT SPEED	3.0	HP	480	3	PB-10-01	N	Indoor
EDR-10.142	BYPASS GATE 2		NEW	STANDBY	CONSTANT SPEED	3.0	HP	480	3	PB-10-01	N	Indoor
EDR-10.150	WET WELL EQUALIZATION GATE		NEW	STANDBY		3.0	HP	480	3	PB-10-01	N	Indoor
EDR-10.211	PUMP 1 INLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-03	N	Indoor
EDR-10.219	PUMP 1 OUTLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-03	N	Indoor
EDR-10.221	PUMP 2 INLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-03	N	Indoor
EDR-10.229	PUMP 2 OUTLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-03	N	Indoor
EDR-10.231	PUMP 3 INLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.239	PUMP 3 OUTLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.241	PUMP 4 INLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.249	PUMP 4 OUTLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.251	PUMP 5 INLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.259	PUMP 5 OUTLET KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.311	EXCESS FLOW MAG METER UPSTREAM ISO KNIFE GATE		NEW	STANDBY	CONSTANT SPEED	2.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.317	EXCESS FLOW MAG METER DOWNSTREAM ISO KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.319	EXCESS FLOW MAG METER BYPASS KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-03	N	Indoor
EDR-10.321	HEADWORKS MAG METER UPSTREAM ISOLATION KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-02	N	Indoor
EDR-10.327	HEADWORKS MAG METER DOWNSTREAM ISO KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-01	N	Indoor
EDR-10.329	HEADWORKS MAG METER BYPASS KNIFE GATE		NEW	STANDBY		2.0	HP	480	3	PB-10-02	N	Indoor
SF-10.933	STAIRWELL SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.5	HP	120	1	LP-10-01	N	Indoor
TPV-10.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-10-01	N	Indoor
HP-10.941	CC LS HEAT PUMP 1	23_81_44	NEW	DUTY		26.5	AMP	480	3	PB-10-01	N	Indoor
HP-10.942	CC LS HEAT PUMP 2	23_81_44	NEW	STANDBY		26.5	AMP	480	3	PB-10-01	N	Indoor
EAM-10.315	EXCESS FLOW HOLDING BASIN FCV		NEW	DUTY	CONSTANT SPEED	0.5	HP	480	3	PB-10-01	N	Indoor
	General Comments: ETAP TAG EDR-10-01											
LCP-10.400	LS SUMP PUMP 1 & 2	43-25-00.10	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-10-01	Y	Indoor
	General Comments: ETAP TAG 10-PMP-01											
PPU-10.971	CNTRL ROOM POSITIVE PRESSURIZATION UNIT		NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-10-01	N	Indoor
PPU-10.972	ELECT ROOM POSITIVE PRESSURIZATION UNIT		NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-10-01	N	Indoor
VCP-10.960	WATER PUMPS (2) FOR HEAT PUMPS	23_21_23	NEW	DUTY	VARIABLE SPEED	7.4	AMP	480	3	PB-10-01	N	Indoor
EF-10.921	LS EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-10B	Y	Indoor
	General Comments: 8,800 CFM											
PMP-10.215	LIFT STATION PUMP 1	43_25_13.30	NEW	DUTY	VARIABLE SPEED	110.0	HP	480	3	MCC-10A	Y	Indoor
	General Comments: ETAP TAG 10A-PMP-1											

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

10 | NEW LIFT STATION

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
PMP-10.225	LIFT STATION PUMP 2	43_25_13.30	NEW	DUTY	VARIABLE SPEED	110.0	HP	480	3	MCC-10A	Y	Indoor
General Comments:	*ETAP TAG 10B-PMP-2*											
SF-10.932	WET-WELL 2 SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	MCC-10B	N	Indoor
BAR-10.115	LS COARSE SCREEN 1	46_21_10	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-10A	Y	Indoor
General Comments:	*ETAP TAG LS SCR-10-1*											
BAR-10.125	LS COARSE SCREEN 2	46_21_10	FUTURE	STANDBY	CONSTANT SPEED	2.0	HP	480	3	MCC-10B	Y	Indoor
General Comments:	*ETAP TAG LS SCR-10-2*											
BAR-10.135	LS COARSE SCREEN 3	46_21_10	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-10B	Y	Indoor
General Comments:	*ETAP TAG LS SCR-10-2*											
MAU-10.911	LS MAKEUP AIR UNIT	23_83_05	NEW	DUTY	CONSTANT SPEED	8.0	HP	480	3	PB-10-01	Y	Indoor
General Comments:	*8,000 CFM*											
PMP-10.235	LIFT STATION PUMP 3	43_25_13.30	NEW	DUTY	VARIABLE SPEED	110.0	HP	480	3	MCC-10B	Y	Indoor
General Comments:	*ETAP TAG 10A-PMP-3*											
PMP-10.245	LIFT STATION PUMP 4	43_25_13.30	NEW	DUTY	VARIABLE SPEED	110.0	HP	480	3	MCC-10B	Y	Indoor
General Comments:	*ETAP TAG 10B-PMP-4*											
SF-10.931	WET-WELL 1 SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	MCC-10A	N	Indoor
PMP-10.255	LIFT STATION PUMP 5	43_25_13.30	NEW	DUTY	VARIABLE SPEED	110.0	HP	480	3	MCC-10B	Y	Indoor
General Comments:	*ETAP TAG 10A-PMP-5*											
MTS-10-01	MANUAL TRANSFER SWITCH		NEW	STANDBY	CONSTANT SPEED	225.0	AMP	480	3	MCC-10B	N	Indoor

11 | EXCESS FLOW HOLDING BASIN

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDR-11.101	CONTROL BOX GATE		NEW	DUTY	CONSTANT SPEED	3.0	HP	480	3	PB-10-03	N	Outdoor

20 | NEW HEADWORKS

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
BMS-20.900	HEADWORKS BMS CONTROL PANEL		NEW	DUTY		20.0	AMP	120	1	LP-20-01	N	Indoor
EDR-20.111	SCREEN INLET GATE 1		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-20-03	Y	Indoor
EDR-20.119	SCREEN OUTLET GATE 1		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-20-03	Y	Indoor
EDR-20.121	SCREEN INLET GATE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-02	Y	Indoor
EDR-20.129	SCREEN OUTLET GATE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-02	Y	Indoor
EDR-20.131	SCREEN INLET GATE 3		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-02	Y	Indoor
EDR-20.139	SCREEN OUTLET GATE 3		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-02	Y	Indoor
EDR-20.191	BYPASS GATE TO EFHB		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-01	Y	Indoor
EDR-20.211	GRIT INLET GATE 1		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-03	Y	Indoor
EDR-20.221	GRIT INLET GATE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-02	Y	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

20 | NEW HEADWORKS

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDR-20.231	GRIT INLET GATE 3		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-02	Y	Indoor
MISC-HW	LIGHTING AND MISC. AT HEADWORKS		NEW	DUTY		25.0	KVA	208	3	LP-20-01	Y	Indoor
SF-20.931	STAIRWELL SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.5	HP	120	1	LP-20-01	N	Indoor
TPV-20.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-20-01	N	Indoor
HP-20.942	HW HEAT PUMP 2		NEW	STANDBY		15.5	AMP	480	3	PB-20-01	N	Indoor
PPU-20.972	HW CNTRL ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-20-01	N	Indoor
HP-20.941	HW HEAT PUMP 1		NEW	DUTY		15.5	AMP	480	3	PB-20-01	N	Indoor
VCP-20.960	WATER PUMPS (2) FOR HEAT PUMPS	23_21_23	NEW	DUTY	VARIABLE SPEED	6.4	AMP	480	3	PB-20-01	N	Indoor
PPU-20.971	HW ELECT ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-20-01	N	Indoor
MTS-20-01	MANUAL TRANSFER SWITCH		NEW	STANDBY	CONSTANT SPEED	225.0	AMP	480	3	MCC-20B	N	Indoor
	ROLLUP DOOR D2002		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-20-01	N	Indoor
General Comments:	*ETAP TAG RUD-81.01*											
PMP-20.323	GRIT PUMP 2		FUTURE	STANDBY	CONSTANT SPEED	10.0	HP	480	3	MCC-20B	N	Indoor
FAN-20.892	HW ODOR CONTROL FOUL AIR FAN 2	23_34_17	NEW	DUTY	VARIABLE SPEED	40.0	HP	480	3	MCC-20B	Y	Indoor
General Comments:	*ODOR CONTROL SCRUBBER FAN*											
FAN-20.894	HW ODOR CONTROL FOUL AIR FAN 4	23_34_17	NEW	DUTY	CONSTANT SPEED	10.0	HP	480	3	MCC-20B	Y	Indoor
General Comments:	*HEADWORKS ODOR CONTROL SCRUBBER FAN FOR SMALL SYSTEM*											
MAU-20.911	HW MAKEUP AIR UNIT	23_83_05	NEW	DUTY	VARIABLE SPEED	40.0	HP	480	3	PB-20-01	Y	Indoor
SWP-20.116	SCREENINGS WASHER/COMPACTOR 1	46_21_28	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-20A	Y	Indoor
SCR-20.114	FINE SCREEN 1	46_21_28	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-20A	Y	Indoor
GRD-20.411	GRIT DEWATERING UNIT 1	46_23_25	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	MCC-20A	Y	Indoor
CON-20.412	SCREW CONVEYOR 1	46_23_25	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-20A	Y	Indoor
FAN-20.891	HW ODOR CONTROL FOUL AIR FAN 1	23_34_17	NEW	DUTY	VARIABLE SPEED	40.0	HP	480	3	MCC-20A	Y	Indoor
General Comments:	*ODOR CONTROL SCRUBBER FAN*											
GRD-20.421	GRIT DEWATERING UNIT 2	46_23_25	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	MCC-20B	Y	Indoor
CON-20.422	SCREW CONVEYOR 2	46_23_25	FUTURE	STANDBY	CONSTANT SPEED	1.5	HP	480	3	MCC-20B	Y	Indoor
SWP-20.136	SCREENINGS WASHER/COMPACTOR 3	46_21_28	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-20B	Y	Indoor
SCR-20.134	FINE SCREEN 3	46_21_28	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-20B	Y	Indoor
GRD-20.431	GRIT DEWATERING UNIT 3	46_23_25	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	MCC-20B	Y	Indoor
CON-20.432	SCREW CONVEYOR 3	46_23_25	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-20B	Y	Indoor
FAN-20.893	HW ODOR CONTROL FOUL AIR FAN 3	23_34_17	NEW	STANDBY	VARIABLE SPEED	40.0	HP	480	3	MCC-20A	N	Indoor
PMP-20.313	GRIT PUMP 1		NEW	DUTY	CONSTANT SPEED	10.0	HP	480	3	MCC-20A	N	Indoor
SWP-20.126	SCREENINGS WASHER/COMPACTOR 2	46_21_28	FUTURE	STANDBY	CONSTANT SPEED	5.0	HP	480	3	MCC-20B	Y	Indoor
SCR-20.124	FINE SCREEN 2	46_21_28	FUTURE	STANDBY	CONSTANT SPEED	2.0	HP	480	3	MCC-20B	Y	Indoor
PMP-20.333	GRIT PUMP 3		NEW	DUTY	CONSTANT SPEED	10.0	HP	480	3	MCC-20B	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

30 | SELECTOR BASIN

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDR-30.110	SELECTOR BASIN MLR PLUG VALVE 1		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-20-03	N	Indoor
EDR-30.210	SELECTOR BASIN MLR PLUG VALVE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-03	N	Indoor
EDR-30.310	SELECTOR BASIN MLR PLUG VALVE 3		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-02	N	Indoor
EDR-30.410	SELECTOR BASIN MLR PLUG VALVE 4		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-20-02	N	Indoor
MIX-30.401	SELECTOR BASIN CHANNEL 4, MIXER 1	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20B	N	Indoor
MIX-30.402	SELECTOR BASIN CHANNEL 4, MIXER 2	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20B	N	Indoor
MIX-30.403	SELECTOR BASIN CHANNEL 4, MIXER 3	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20B	N	Indoor
MIX-30.404	SELECTOR BASIN CHANNEL 4, MIXER 4	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20B	N	Indoor
MIX-30.052	DENITRIFICATION ZONE 2 MIXER	46_41_25	NEW	DUTY	CONSTANT SPEED	8.3	HP	480	3	MCC-20B	N	Indoor
General Comments:	*RAS/DENITE ZONE*											
MIX-30.301	SELECTOR BASIN CHANNEL 3, MIXER 1	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20B	N	Indoor
MIX-30.302	SELECTOR BASIN CHANNEL 3, MIXER 2	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20B	N	Indoor
MIX-30.303	SELECTOR BASIN CHANNEL 3, MIXER 3	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20B	N	Indoor
MIX-30.304	SELECTOR BASIN CHANNEL 3, MIXER 4	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20B	N	Indoor
MIX-30.051	DENITRIFICATION ZONE 1 MIXER	46_41_25	NEW	DUTY	CONSTANT SPEED	8.3	HP	480	3	MCC-20A	N	Indoor
General Comments:	*RAS/DENITE ZONE*											
MIX-30.101	SELECTOR BASIN CHANNEL 1, MIXER 1	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20A	N	Indoor
MIX-30.102	SELECTOR BASIN CHANNEL 1, MIXER 2	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20A	N	Indoor
MIX-30.103	SELECTOR BASIN CHANNEL 1, MIXER 3	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20A	N	Indoor
MIX-30.104	SELECTOR BASIN CHANNEL 1, MIXER 4	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20A	N	Indoor
MIX-30.201	SELECTOR BASIN CHANNEL 2, MIXER 1	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20A	N	Indoor
MIX-30.202	SELECTOR BASIN CHANNEL 2, MIXER 2	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20A	N	Indoor
MIX-30.203	SELECTOR BASIN CHANNEL 2, MIXER 3	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20A	N	Indoor
MIX-30.204	SELECTOR BASIN CHANNEL 2, MIXER 4	46_41_25	NEW	DUTY	CONSTANT SPEED	6.0	HP	480	3	MCC-20A	N	Indoor

35 | AERATION BASINS/AB SPLITTER BOX

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EAM-35.105	AB1 - AIR FLOW CONTROL VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-03	N	Indoor
EAM-35.205	AB2 - AIR FLOW CONTROL VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-03	N	Indoor
EAM-35.305	AB3 - AIR FLOW CONTROL VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-02	N	Indoor
EAM-35.405	AB4 - AIR FLOW CONTROL VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-02	N	Indoor
MIX-35.111	AERATION BASIN 1, MIXER 1		NEW	DUTY	CONSTANT SPEED	3.5	HP	480	3	MCC-36A	N	Indoor
MIX-35.112	AERATION BASIN 1, MIXER 2		NEW	DUTY	CONSTANT SPEED	3.5	HP	480	3	MCC-36A	N	Indoor
MIX-35.211	AERATION BASIN 2, MIXER 1		NEW	DUTY	CONSTANT SPEED	3.5	HP	480	3	MCC-36A	N	Indoor
MIX-35.212	AERATION BASIN 2, MIXER 2		NEW	DUTY	CONSTANT SPEED	3.5	HP	480	3	MCC-36A	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

35 | AERATION BASINS/AB SPLITTER BOX

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
MIX-35.311	AERATION BASIN 3, MIXER 1		NEW	DUTY	CONSTANT SPEED	3.5	HP	480	3	MCC-36B	N	Indoor
General Comments:	*ETAP TAG PMP-36.05*											
MIX-35.312	AERATION BASIN 3, MIXER 2		NEW	DUTY	CONSTANT SPEED	3.5	HP	480	3	MCC-36B	N	Indoor
General Comments:	*ETAP TAG PMP-36.06*											
MIX-35.411	AERATION BASIN 4, MIXER 1		NEW	DUTY	CONSTANT SPEED	3.5	HP	480	3	MCC-36B	N	Indoor
General Comments:	*ETAP TAG PMP-36.07*											
MIX-35.412	AERATION BASIN 4, MIXER 2		NEW	DUTY	CONSTANT SPEED	3.5	HP	480	3	MCC-36B	N	Indoor

36 | AERATION BASINS BLOWER BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
	MONORAIL (BLOWER ROOM)		NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	PB-36-01	N	Indoor
ABB-MISC	MISC LOADS AT AERATION BLOWER BUILDING		NEW	DUTY		15.0	KVA	208	3	LP-36-01	Y	Indoor
ALP-96.381	EMERGENCY SHOWER/EWASH STATION INSTANTANEOUS WATER HEATER	22_42_01	NEW	STANDBY	CONSTANT SPEED	108.0	KW	480	3	PB-36-01	N	Indoor
BMS-36.900	AB BLOWER BUILDING BMS CONTROL PANEL		NEW	DUTY		20.0	AMP	120	1	LP-36-01	N	Indoor
EDR-36.112	AB BLOWER 1 DISCHARGE VALVE	40_05_64	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-03	Y	Indoor
EDR-36.122	AB BLOWER 2 DISCHARGE VALVE	40_05_64	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-36-03	Y	Indoor
EDR-36.132	AB BLOWER 3 DISCHARGE VALVE	40_05_64	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-36-02	Y	Indoor
EDR-36.142	AB BLOWER 4 DISCHARGE VALVE	40_05_64	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-36-02	Y	Indoor
EDR-36.152	AB BLOWER 5 DISCHARGE VALVE	40_05_64	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-36-03	Y	Indoor
EDR-36.195	AERATION MAIN HEADER BLOW OFF VALVE	40_05_64	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-36-01	N	Indoor
FV-36.115	AB BLOWER 1 BLOW-OFF VALVE	40_05_64	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-03	N	Indoor
FV-36.125	AB BLOWER 2 BLOW-OFF VALVE	40_05_64	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-03	N	Indoor
FV-36.135	AB BLOWER 3 BLOW-OFF VALVE	40_05_64	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-02	N	Indoor
FV-36.145	AB BLOWER 4 BLOW-OFF VALVE	40_05_64	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-02	N	Indoor
FV-36.155	AB BLOWER 5 BLOW-OFF VALVE	40_05_64	FUTURE	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-36-03	N	Indoor
GUH-36.951	BLOWER ROOM GAS INFRA-RED TUBE HEATER	23_83_01	NEW	DUTY		5.5	AMP	120	1	LP-36-01	N	Indoor
GUH-36.952	BLOWER ROOM GAS INFRA-RED TUBE HEATER	23_83_01	NEW	DUTY		5.5	AMP	120	1	LP-36-01	N	Indoor
HP-36.941	ABBB HEAT PUMP 1		NEW	DUTY		26.5	AMP	480	3	PB-36-01	N	Indoor
HP-36.942	ABBB HEAT PUMP 2		NEW	STANDBY		26.5	AMP	480	3	PB-36-01	N	Indoor
PPU-36.973	SWITCHGEAR ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-36-01	N	Indoor
TPV-36.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-36-01	N	Indoor
VCP-36.960	WATER PUMPS (2) FOR HEAT PUMPS	23_21_23	NEW	DUTY		7.4	AMP	480	3	PB-36-01	N	Indoor
BLO-36.150	AB BLOWER 5	43_11_15	FUTURE	DUTY	VARIABLE SPEED	300.0	HP	480	3	SWG-36A	N	Indoor
PPU-36.972	ELECT ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-36-01	N	Indoor
PPU-36.971	CNTRL ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-36-01	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

36 | AERATION BASINS BLOWER BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
BLO-36.110	AB BLOWER 1	43_11_15	NEW	STANDBY	VARIABLE SPEED	200.0	HP	480	3	SWG-36A	N	Indoor
BLO-36.120	AB BLOWER 2	43_11_15	NEW	DUTY	VARIABLE SPEED	300.0	HP	480	3	SWG-36A	N	Indoor
BLO-36.130	AB BLOWER 3	43_11_15	NEW	DUTY	VARIABLE SPEED	300.0	HP	480	3	SWG-36B	N	Indoor
BLO-36.140	AB BLOWER 4	43_11_15	NEW	DUTY	VARIABLE SPEED	300.0	HP	480	3	SWG-36B	N	Indoor
	ROLLUP DOOR 36 (SOUTH)		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-36-01	N	Indoor
General Comments:	*ETAP TAG RUD-81.01*											
EF-36.921	BLOWER BLDG EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	MCC-36A	N	Indoor
General Comments:	*BLOWER ROOM ROOF-MOUNTED EXHAUST FAN*											
SF-36.931	BLOWER BLDG SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-36A	N	Indoor
General Comments:	*BLOWER ROOM INLINE SUPPLY FAN*											
MTS-36-01	MANUAL TRANSFER SWITCH		NEW	STANDBY	CONSTANT SPEED	225.0	AMP	480	3	MCC-36B	N	

40 | SECONDARY CLARIFIERS/CLARIFIERS SPLITTER BOX

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
SC-40.110	SECONDARY CLARIFIER 1 DRIVE		EXISTING	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-45A	N	Outdoor
PMP-40.116	SC 1&2 SCUM PIT PUMP 1	43_25_13.32	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-45A	N	Outdoor
PMP-40.117	SC 1&2 SCUM PIT PUMP 2	43_25_13.32	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-45A	N	Outdoor
SC-40.120	SECONDARY CLARIFIER 2 DRIVE		EXISTING	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-45A	N	Outdoor
SC-40.130	SECONDARY CLARIFIER 3 DRIVE		EXISTING	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-45A	N	Outdoor
PMP-40.136	SC 3&4 SCUM PIT PUMP 1	43_25_13.32	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-45A	N	Outdoor
PMP-40.137	SC 3&4 SCUM PIT PUMP 2	43_25_13.32	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-45A	N	Outdoor
SC-40.140	SECONDARY CLARIFIER 4 DRIVE		EXISTING	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-45A	N	Outdoor
SC-40.150	SECONDARY CLARIFIER 5 DRIVE	46_43_24	FUTURE	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-45B	N	Outdoor
PMP-40.156	SC 5&6 SCUM PIT PUMP 1	43_25_13.32	FUTURE	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-45B	N	Outdoor
PMP-40.157	SC 5&6 SCUM PIT PUMP 2	43_25_13.32	FUTURE	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-45B	N	Outdoor
SC-40.160	SECONDARY CLARIFIER 6 DRIVE	46_43_24	FUTURE	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-45B	N	Outdoor
SC-40.170	SECONDARY CLARIFIER 7 DRIVE	46_43_24	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-45B	N	Outdoor
PMP-40.176	SC 7&8 SCUM PIT PUMP 1	43_25_13.32	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-45B	N	Outdoor
PMP-40.177	SC 7&8 SCUM PIT PUMP 2	43_25_13.32	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-45B	N	Outdoor
SC-40.180	SECONDARY CLARIFIER 8 DRIVE	46_43_24	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-45B	N	Outdoor

45 | RECYCLE PUMP STATION

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
	RECYCLE PS BRIDGE CRANE TROLLEY	41_22_16	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-01	N	Outdoor
BMS-45.900	RPS BMS CONTROL PANEL		NEW	DUTY		20.0	AMP	120	1	LP-45-01	N	Outdoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

45 | RECYCLE PUMP STATION

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDR-45.110	MLR PUMP 1 SUCTION PLUG VALVE	40_05_62	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.114	MLR PUMP 1 DISCHARGE PLUG VALVE	40_05_62	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.120	MLR PUMP 2 SUCTION PLUG VALVE	40_05_62	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.124	MLR PUMP 2 DISCHARGE PLUG VALVE	40_05_62	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.130	MLR PUMP 3 SUCTION PLUG VALVE	40_05_62	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.134	MLR PUMP 3 DISCHARGE PLUG VALVE	40_05_62	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.140	MLR PUMP 4 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.144	MLR PUMP 4 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.150	MLR PUMP 5 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.154	MLR PUMP 5 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.201	SC NO. 1 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.202	SC NO. 2 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.203	SC NO. 3 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.204	SC NO. 4 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.205	SC NO. 5 PLUG VALVE	40_05_62	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.206	SC NO. 6 PLUG VALVE	40_05_62	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.207	SC NO. 7 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.208	SC NO. 8 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.210	RAS PUMP 1 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.214	RAS PUMP 1 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.215	RAS PUMP 2 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.219	RAS PUMP 2 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.220	RAS PUMP 3 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.224	RAS PUMP 3 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.225	RAS SUCTION HEADER PUMPS 1-2 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.226	RAS SUCTION HEADER PUMPS 2-3 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.227	RAS SUCTION HEADER PUMPS 3-4 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.228	RAS SUCTION HEADER PUMPS 4-5 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.229	RAS SUCTION HEADER PUMPS 5-6 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.230	RAS PUMP 4 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.234	RAS PUMP 4 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.235	RAS PUMP 5 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.239	RAS PUMP 5 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.240	RAS PUMP 6 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor
EDR-45.244	RAS PUMP 6 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-05	N	Outdoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

45 | RECYCLE PUMP STATION

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDR-45.250	RAS PUMP 7 SUCTION PLUG VALVE	40_05_62	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.254	RAS PUMP 7 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.255	RAS PUMP 8 SUCTION PLUG VALVE	40_05_62	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.259	RAS PUMP 8 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.260	RAS PUMP 9 SUCTION PLUG VALVE	40_05_62	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.264	RAS PUMP 9 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.265	RAS SUCTION HEADER PUMPS 7-8 PLUG VALVE	40_05_62	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.266	RAS SUCTION HEADER PUMPS 8-9 PLUG VALVE	40_05_62	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.267	RAS SUCTION HEADER PUMPS 9-10 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.268	RAS SUCTION HEADER PUMPS 10-11 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.269	RAS SUCTION HEADER PUMPS 11-12 PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.270	RAS PUMP 10 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.274	RAS PUMP 10 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.275	RAS PUMP 11 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.279	RAS PUMP 11 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.280	RAS PUMP 12 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.284	RAS PUMP 12 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-04	N	Outdoor
EDR-45.300	WAS PUMP BYPASS VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-01	N	Outdoor
EDR-45.301	WAS SUCTION HEADER ISOLATION VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-45-01	N	Outdoor
EDR-45.303	WAS DISCHARGE MM ISO VALVE 1	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-01	N	Outdoor
EDR-45.307	WAS DISCHARGE MM ISO VALVE 2	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-01	N	Outdoor
EDR-45.310	WAS PUMP 1 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.314	WAS PUMP 1 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-03	N	Outdoor
EDR-45.320	WAS PUMP 2 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.324	WAS PUMP 2 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.330	WAS PUMP 3 SUCTION PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
EDR-45.334	WAS PUMP 3 DISCHARGE PLUG VALVE	40_05_62	NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-45-02	N	Outdoor
HP-45.941	RPS HEAT PUMP 1		NEW	DUTY		39.9	AMP	480	3	PB-45-01	N	Outdoor
TPV-45.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-45-01	N	Outdoor
PPU-45.971	ELECT ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-45-01	N	Outdoor
PMP-45.111	MLR PUMP 1	43_23_31.30	NEW	DUTY	VARIABLE SPEED	100.0	HP	480	3	SWG-45A	N	Outdoor
PMP-45.121	MLR PUMP 2	43_23_31.30	NEW	DUTY	VARIABLE SPEED	100.0	HP	480	3	SWG-45B	N	Outdoor
MTS-45-01	MANUAL TRANSFER SWITCH		NEW	STANDBY	CONSTANT SPEED	225.0	AMP	480	3	MCC-45B	N	Outdoor
VCP-45.960	WATER PUMPS (2) FOR HEAT PUMPS	23_21_23	NEW	DUTY	VARIABLE SPEED	7.4	AMP	480	3	PB-45-01	N	Outdoor
PMP-45.131	MLR PUMP 3	43_23_31.30	NEW	DUTY	VARIABLE SPEED	100.0	HP	480	3	SWG-45A	N	Outdoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

45 | RECYCLE PUMP STATION

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
PMP-45.141	MLR PUMP 4	43_23_31.30	NEW	DUTY	VARIABLE SPEED	100.0	HP	480	3	SWG-45B	N	Outdoor
PMP-45.151	MLR PUMP 5	43_23_31.30	FUTURE	DUTY	VARIABLE SPEED	100.0	HP	480	3	SWG-45B	N	Outdoor
HP-45.942	RPS HEAT PUMP 2		NEW	STANDBY		39.9	AMP	480	3	PB-45-01	N	Outdoor
	RECYCLE PS BRIDGE MOTOR 2		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-45-01	N	Outdoor
	RECYCLE PS BRIDGE CRANE HOIST		NEW	DUTY	CONSTANT SPEED	7.5	HP	480	3	PB-45-01	N	Outdoor
PPU-45.972	CNTRL ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-45-01	N	Outdoor
EF-45.921	RPS EXHAUST FAN 1	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-45A	N	Outdoor
General Comments:	*6,000 CFM SIDEWALL MOUNTED FAN*											
EF-45.923	RPS EXHAUST FAN 3	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-45A	N	Outdoor
General Comments:	*6,000 CFM SIDEWALL MOUNTED FAN*											
MAU-45.911	RPS MAKEUP AIR UNIT	23_83_05	NEW	DUTY	CONSTANT SPEED	15.0	HP	480	3	MCC-45A	N	Outdoor
	ROLLUP DOOR 45 (EAST)		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-45-01	N	Outdoor
General Comments:	*ETAP TAG RUD-81.01*											
PMP-45.211	RAS PUMP 1	43_23_31.30	NEW	DUTY	VARIABLE SPEED	15.0	HP	480	3	MCC-45A	N	Outdoor
PMP-45.216	RAS PUMP 2	43_23_31.30	NEW	STANDBY	VARIABLE SPEED	15.0	HP	480	3	MCC-45A	N	Outdoor
PMP-45.331	WAS PUMP 3	43_23_57.10	FUTURE	DUTY	VARIABLE SPEED	25.0	HP	480	3	MCC-45B	N	Outdoor
PMP-45.221	RAS PUMP 3	43_23_31.30	NEW	DUTY	VARIABLE SPEED	15.0	HP	480	3	MCC-45A	N	Outdoor
PMP-45.321	WAS PUMP 2	43_23_57.10	NEW	DUTY	VARIABLE SPEED	25.0	HP	480	3	MCC-45B	N	Outdoor
PMP-45.251	RAS PUMP 7	43_23_31.30	FUTURE	DUTY	VARIABLE SPEED	20.0	HP	480	3	MCC-45B	N	Outdoor
PMP-45.256	RAS PUMP 8	43_23_31.30	FUTURE	STANDBY	VARIABLE SPEED	20.0	HP	480	3	MCC-45B	N	Outdoor
PMP-45.261	RAS PUMP 9	43_23_31.30	FUTURE	DUTY	VARIABLE SPEED	20.0	HP	480	3	MCC-45B	N	Outdoor
PMP-45.271	RAS PUMP 10	43_23_31.30	NEW	DUTY	VARIABLE SPEED	20.0	HP	480	3	MCC-45B	N	Outdoor
PMP-45.276	RAS PUMP 11	43_23_31.30	NEW	STANDBY	VARIABLE SPEED	20.0	HP	480	3	MCC-45B	N	Outdoor
PMP-45.281	RAS PUMP 12	43_23_31.30	NEW	DUTY	VARIABLE SPEED	20.0	HP	480	3	MCC-45B	N	Outdoor
PMP-45.231	RAS PUMP 4	43_23_31.30	NEW	DUTY	VARIABLE SPEED	15.0	HP	480	3	MCC-45A	N	Outdoor
PMP-45.241	RAS PUMP 6	43_23_31.30	NEW	DUTY	VARIABLE SPEED	15.0	HP	480	3	MCC-45A	N	Outdoor
PMP-45.236	RAS PUMP 5	43_23_31.30	NEW	STANDBY	VARIABLE SPEED	15.0	HP	480	3	MCC-45A	N	Outdoor
PMP-45.311	WAS PUMP 1	43_23_57.10	NEW	DUTY	VARIABLE SPEED	25.0	HP	480	3	MCC-45A	N	Outdoor
EF-45.922	RPS EXHAUST FAN 2	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-45B	N	Outdoor
General Comments:	*6,000 CFM SIDEWALL MOUNTED FAN*											
EF-45.924	RPS EXHAUST FAN 4	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-45B	N	Outdoor
General Comments:	*6,000 CFM SIDEWALL MOUNTED FAN*											

55 | FILTERS

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
	EFFLUENT AERATION BLOWER 1		DEMO	DUTY	CONSTANT SPEED	15.0	HP	480	3	MCC-3A	N	Outdoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

55 | FILTERS

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
	EFFLUENT AERATION BLOWER 2		DEMO	DUTY	CONSTANT SPEED	15.0	HP	480	3	MCC-3B	N	Outdoor
EDR-55.110	FILTER NO. 1 INLET VALVE		EXISTING	DUTY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.111	FILTER NO. 1 BACKWASH WASTE VALVE		EXISTING	DUTY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.112	FILTER NO. 1 AIR WASH SUPPLY VALVE		EXISTING	DUTY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.120	FILTER NO. 2 INLET VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.121	FILTER NO. 2 BACKWASH WASTE VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.122	FILTER NO. 2 AIR WASH SUPPLY VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.130	FILTER NO. 3 INLET VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.131	FILTER NO. 3 BACKWASH WASTE VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.132	FILTER NO. 3 AIR WASH SUPPLY VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.140	FILTER NO. 4 INLET VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.141	FILTER NO. 4 BACKWASH WASTE VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.142	FILTER NO. 4 AIR WASH SUPPLY VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.100	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.210	FILTER NO. 5 INLET VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.211	FILTER NO. 5 BACKWASH WASTE VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.212	FILTER NO. 5 AIR WASH SUPPLY VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.220	FILTER NO. 6 INLET VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.221	FILTER NO. 6 BACKWASH WASTE VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.222	FILTER NO. 6 AIR WASH SUPPLY VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.230	FILTER NO. 7 INLET VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

55 | FILTERS

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDR-55.231	FILTER NO. 7 BACKWASH WASTE VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.232	FILTER NO. 7 AIR WASH SUPPLY VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.240	FILTER NO. 8 INLET VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.241	FILTER NO. 8 BACKWASH WASTE VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
EDR-55.242	FILTER NO. 8 AIR WASH SUPPLY VALVE		EXISTING	STANDBY	CONSTANT SPEED	1.0	HP	120	1	VCP-55.200	N	Outdoor
General Comments:	*BUTTERFLY VALVE*											
BLO-55.413	FILTER AIRWASH BLOWER 1		NEW	DUTY	CONSTANT SPEED	50.0	HP	480	3	MCC-60A	N	Outdoor
General Comments:	*ETAP TAG BLO-60.01*											
PMP-55.520	AUXILIARY BACKWASH PUMP 2		FUTURE	DUTY	CONSTANT SPEED	20.0	HP	480	3	MCC-60B	N	Indoor
General Comments:	*ETAP TAG PMP-60-06*											
PMP-55.510	AUXILIARY BACKWASH PUMP 1		EXISTING	DUTY	CONSTANT SPEED	20.0	HP	480	3	MCC-60A	N	Outdoor
General Comments:	*ETAP TAG PMP-60.01*											
EDR-55.052	F SPLITTER MOTORIZED GATE 2		FUTURE	DUTY	CONSTANT SPEED	0.5	HP	480	3	PB-60-02	N	Outdoor
General Comments:	*ETAP TAG GAT-60.02*											
BLO-55.423	FILTER AIRWASH BLOWER 2		FUTURE	DUTY	CONSTANT SPEED	50.0	HP	480	3	MCC-60B	N	Outdoor
General Comments:	*ETAP TAG BLO-60.2*											
EDR-55.051	F SPLITTER MOTORIZED GATE 1		FUTURE	DUTY	CONSTANT SPEED	0.5	HP	480	3	PB-60-03	N	Outdoor
General Comments:	*ETAP TAG GAT-60.01*											

60 | DISINFECTION BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
BMS-60.900	DISINFECTION BLDG BMS CONTROL PANEL		NEW	DUTY		20.0	AMP	120	1	LP-60-01	N	Indoor
COS-60.010	AUTOMATIC SAMPLER	11_53_02	NEW	DUTY		0.5	HP	120	0	LP-60-01	N	Indoor
EDR-60.090	FILTER AUXILLIARY BACKWASH INLET GATE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-60-01	N	Indoor
EDR-60.110	UV CHANNEL 1 INFLUENT GATE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-60-03	N	Indoor
EDR-60.134	UV CHANNEL 1 EFFLUENT GATE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-03	N	Indoor
EDR-60.210	UV CHANNEL 2 INFLUENT GATE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-02	N	Indoor
EDR-60.234	UV CHANNEL 2 EFFLUENT GATE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-02	N	Indoor
EDR-60.310	PLANT WATER PUMP STATION INLET GATE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-01	N	Indoor
EDR-60.324	3W PUMP 1 DISCHARGE VALVE		NEW	DUTY		1.0	HP	480	0	PB-60-03	N	Indoor
EDR-60.334	3W PUMP 2 DISCHARGE VALVE		NEW	DUTY		1.0	HP	480	0	PB-60-02	N	Indoor
GUH-60-951	3W ROOM GAS INFRA-RED TUBE HEATER		NEW	DUTY		5.5	AMP	120	1	LP-60-01	N	Indoor
GUH-60-952	BLOWER ROOM GAS INFRA-RED TUBE HEATER		NEW	DUTY		5.5	AMP	120	1	LP-60-01	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

60 | DISINFECTION BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
TPV-60.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-60-01	N	Indoor
SF-60.932	3W ROOM SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.3	HP	480	3	MCC-60B	N	Indoor
General Comments:	*1,500 CFM ROOF MOUNTED SUPPLY FAN*											
HP-60.942	DISINFECTION HEAT PUMP 2		NEW	STANDBY		30.9	AMP	480	3	PB-60-01	N	Indoor
HP-60.941	DISINFECTION HEAT PUMP 1		NEW	DUTY		30.9	AMP	480	3	PB-60-01	N	Indoor
PMP-60.330	3W PUMP 2	43_24_50.10	NEW	DUTY	VARIABLE SPEED	40.0	HP	480	3	MCC-60B	N	Indoor
General Comments:	*ETAP TAG NPW-60.02*											
PMP-60.320	3W PUMP 1	43_24_50.10	NEW	DUTY	VARIABLE SPEED	40.0	HP	480	3	MCC-60A	N	Indoor
General Comments:	*ETAP TAG NPW-60.01*											
EF-60.922	3W ROOM EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.3	HP	120	1	LP-60-01	N	Indoor
General Comments:	*1,500 CFM ROOF MOUNTED SUPPLY FAN*											
PPU-60.971	ELECT & CNTRL ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-60-01	N	Indoor
VCP-60-960	WATER PUMPS (2) FOR HEAT PUMPS	23_21_23	NEW	DUTY	VARIABLE SPEED	7.4	AMP	480	3	PB-60-01	N	Indoor
UVR-60.211	UV CHANNEL 2, REACTOR 1	43_32_64	NEW	DUTY		37.5	AMP	480	3	MCC-60B	Y	Indoor
General Comments:	*ETAP TAG UV PDC-60.03*											
UVR-60.221	UV CHANNEL 2, REACTOR 2	43_32_64	NEW	DUTY		37.5	AMP	480	3	MCC-60B	Y	Indoor
General Comments:	*ETAP TAG UV PDC-60.04*											
EF-60.921	BLOWER ROOM EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	MCC-60A	N	Indoor
General Comments:	*2,500 CFM ROOF MOUNTED EXHAUST FAN*											
MTS-60-01	MANUAL TRANSFER SWITCH		NEW	STANDBY	CONSTANT SPEED	225.0	AMP	480	3	MCC-60B	N	Indoor
SF-60.931	BLOWER ROOM SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	MCC-60A	N	Indoor
General Comments:	*2,500 CFM ROOF MOUNTED SUPPLY FAN*											
UVR-60.111	UV CHANNEL 1 REACTOR 1	43_32_64	NEW	DUTY		37.5	AMP	480	3	MCC-60A	Y	Indoor
General Comments:	*ETAP TAG UV PDC-60.01*											
UVR-60.121	UV CHANNEL 1, REACTOR 2	43_32_64	NEW	DUTY		37.5	AMP	480	3	MCC-60A	Y	Indoor
General Comments:	*ETAP TAG UV PDC-60.02*											

61 | POST AERATION BASIN AND EFFLUENT PUMPING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDM-61.311	BLOWER 1 AMBIENT AIR SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-03	N	Indoor
EDM-61.321	BLOWER 2 AMBIENT AIR SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-02	N	Indoor
EDR-61.110	PAB 1 GATE 1		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-60-03	N	Indoor
EDR-61.111	PAB 1 GATE 2		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-60-03	N	Indoor
EDR-61.113	PAB 1 DIFFUSER VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-03	N	Indoor
EDR-61.210	PAB 2 GATE 1		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-02	N	Indoor
EDR-61.211	PAB 2 GATE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-02	N	Indoor
EDR-61.213	PAB 2 DIFFUSER VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-02	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

61 | POST AERATION BASIN AND EFFLUENT PUMPING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDR-61.318	BLOWER 1 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-03	N	Indoor
EDR-61.328	BLOWER 2 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-02	N	Indoor
EDR-61.460	EFFLUENT WET WELL GATE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-60-01	N	Indoor
BLO-61.323	POST AERATION BLOWER 2	43_11_19	NEW	DUTY	CONSTANT SPEED	40.0	HP	480	3	MCC-60B	N	Indoor
BLO-61.313	POST AERATION BLOWER 1	43_11_19	NEW	DUTY	CONSTANT SPEED	40.0	HP	480	3	MCC-60A	N	Indoor
General Comments:	*ETAP TAG BLO-60.110*											
PMP-61.430	EFFLUENT PUMP STATION PUMP NO. 2	43_24_50.10	NEW	DUTY	VARIABLE SPEED	75.0	HP	480	3	MCC-60B	N	Indoor
General Comments:	*ETAP TAG EPMP-60-02*											
PMP-61.420	EFFLUENT PUMP STATION PUMP NO. 1	43_24_50.10	NEW	DUTY	VARIABLE SPEED	75.0	HP	480	3	MCC-60A	N	Indoor
General Comments:	*ETAP TAG EPMP-60.01*											
PMP-61.450	EFFLUENT PUMP STATION PUMP NO. 4	43_24_50.10	FUTURE	DUTY	VARIABLE SPEED	75.0	HP	480	3	MCC-60B	N	Indoor
General Comments:	*ETAP TAG EPMP-60-04*											
PMP-61.440	EFFLUENT PUMP STATION PUMP NO. 3	43_24_50.10	NEW	DUTY	VARIABLE SPEED	75.0	HP	480	3	MCC-60A	N	Indoor
General Comments:	*ETAP TAG EPMP-60.03*											

80 | DIGESTERS

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EAM-80.112	AD 1A - AIRFLOW CONTROL VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	N	Indoor
EAM-80.162	AD 1B - AIRFLOW CONTROL VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	N	Indoor
EAM-80.212	AD 2A - AIRFLOW CONTROL VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-02	N	Indoor
EAM-80.262	AD 2B - AIRFLOW CONTROL VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-02	N	Indoor
EAM-80.312	AD 3A - AIRFLOW CONTROL VALVE		FUTURE	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	N	Indoor
EAM-80.362	AD 3B - AIRFLOW CONTROL VALVE		FUTURE	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	N	Indoor
MIX-80.100	AD 1A - HYPERBOLOID MIXER	46_41_10	NEW	DUTY	CONSTANT SPEED	40.0	HP	480	3	MCC-82A	N	Indoor
General Comments:	*ETAP TAG MIX-82.101*											
MIX-80.150	AD 1B - HYPERBOLOID MIXER	46_41_10	NEW	DUTY	CONSTANT SPEED	40.0	HP	480	3	MCC-82A	N	Indoor
General Comments:	*ETAP TAG MIX-82.201*											
MIX-80.350	AD 3B - HYPERBOLOID MIXER	46_41_10	FUTURE	DUTY	CONSTANT SPEED	40.0	HP	480	3	MCC-82B	N	Indoor
General Comments:	*ETAP TAG MIX-82.203*											
MIX-80.300	AD 3A - HYPERBOLOID MIXER	46_41_10	FUTURE	DUTY	CONSTANT SPEED	40.0	HP	480	3	MCC-82B	N	Indoor
General Comments:	*FUTURE*											
MIX-80.250	AD 2B - HYPERBOLOID MIXER	46_41_10	NEW	DUTY	CONSTANT SPEED	40.0	HP	480	3	MCC-82B	N	Indoor
MIX-80.200	AD 2A - HYPERBOLOID MIXER	46_41_10	NEW	DUTY	CONSTANT SPEED	40.0	HP	480	3	MCC-82B	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

81 | DIGESTER THICKENING BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
	MONORAIL (BLOWER ROOM)		NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	PB-81-01	N	Indoor
	MONORAIL (MEMBRANE THICKENING ROOM)		NEW	STANDBY	CONSTANT SPEED	7.5	HP	480	3	PB-81-01	N	Indoor
	MONORAIL (PUMP ROOM)		NEW	STANDBY	CONSTANT SPEED	5.0	HP	480	3	PB-81-01	N	Indoor
BMS-81.900	DIGESTER THICKENING BLDG BMS CONTROL PANEL		NEW	DUTY		20.0	AMP	120	1	LP-81-01	N	Indoor
EDR-81.104	MBT 1 MM ISO VALVE 1		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.106	MBT 1 MM ISO VALVE 2		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.111	MEMBRANE TANK 1 EFFLUENT		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.125	MBT 1 DISCHARGE AIR VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.134	MBT 2 MM ISO VALVE 1		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.136	MBT 2 MM ISO VALVE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.141	MEMBRANE TANK 2 EFFLUENT		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.155	MBT 2 DISCHARGE AIR VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.164	MBT 3 MM ISO VALVE 1		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.166	MBT 3 MM ISO VALVE 2		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.171	MEMBRANE TANK 3 EFFLUENT		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.185	MBT 3 DISCHARGE AIR VALVE		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.302	WAS SCREEN 1 SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.306	WAS SCREEN 1 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.322	WAS SCREEN 2 SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.326	WAS SCREEN 2 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.351	WAS SCREENS MM ISO VALVE 1		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.352	WAS SCREENS MM ISO VALVE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.361	DIGESTER 1 INFLUENT CONTROL VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.362	DIGESTER 2 INFLUENT CONTROL VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.363	DIGESTER 3 INFLUENT CONTROL VALVE		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.419	MEMBRANE AIR SCOUR BLOWER 1 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.429	MEMBRANE AIR SCOUR BLOWER 2 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.439	MEMBRANE AIR SCOUR BLOWER 3 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.449	MEMBRANE AIR SCOUR BLOWER 4 DISCHARGE VALVE		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.451	MEMBRANE AIR SCOUR DISCHARGE VALVE 1		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
EDR-81.452	MEMBRANE AIR SCOUR DISCHARGE VALVE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-03	N	Indoor
EDR-81.453	MEMBRANE AIR SCOUR DISCHARGE VALVE 3		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-81-02	N	Indoor
GUH-81.951	BLOWER ROOM GAS INFRA-RED HIGH INTENSITY HEATER	23_83_01	NEW	DUTY		5.5	AMP	120	1	LP-81-01	N	Indoor
GUH-81.952	BLOWER ROOM GAS INFRA-RED TUBE HEATER	23_83_01	NEW	DUTY		5.5	AMP	120	1	LP-81-01	N	Indoor
HP-81.941	MT BLDG HEAT PUMP 1		NEW	DUTY		15.3	AMP	480	3	PB-81-01	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

81 | DIGESTER THICKENING BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
HP-81.942	MT BLDG HEAT PUMP 2		NEW	STANDBY		15.3	AMP	480	3	PB-81-01	N	Indoor
PPU-81.971	ELECTRICAL ROOM PPU	23_41_51	NEW	DUTY	VARIABLE SPEED	1.5	HP	480	3	PB-81-01	N	Indoor
SF-81.931	STAIRWELL SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.5	HP	120	1	LP-81-01	N	Indoor
TPV-81.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-81-01	N	Indoor
VCP-81.960	WATER PUMPS (2) FOR HEAT PUMPS	23_21_23	NEW	DUTY	VARIABLE SPEED	7.4	AMP	480	3	PB-81-01	N	Indoor
BLO-81.411	AIR SCOUR BLOWER 1		NEW	DUTY	VARIABLE SPEED	30.0	HP	480	3	MCC-81	N	Indoor
General Comments:	*ETAP TAG COMP-81-01*											
PMP-81.213	PERMEATE PUMP 1	43_23_57.10	NEW	DUTY	VARIABLE SPEED	5.0	HP	480	3	MCC-81	N	Indoor
BLO-81.421	AIR SCOUR BLOWER 2		NEW	DUTY	VARIABLE SPEED	30.0	HP	480	3	MCC-81	N	Indoor
PMP-81.223	PERMEATE PUMP 2	43_23_57.10	NEW	DUTY	VARIABLE SPEED	5.0	HP	480	3	MCC-81	N	Indoor
BLO-81.431	AIR SCOUR BLOWER 3		NEW	STANDBY	VARIABLE SPEED	30.0	HP	480	3	MCC-81	N	Indoor
PMP-81.233	PERMEATE PUMP 3	43_23_57.10	NEW	STANDBY	VARIABLE SPEED	5.0	HP	480	3	MCC-81	N	Indoor
General Comments:	*ETAP TAG PMP-81.03*											
BLO-81.441	AIR SCOUR BLOWER 4		FUTURE	DUTY	VARIABLE SPEED	30.0	HP	480	3	MCC-81	N	Indoor
PMP-81.243	PERMEATE PUMP 4	43_23_57.10	FUTURE	DUTY	VARIABLE SPEED	5.0	HP	480	3	MCC-81	N	Indoor
	ROLLUP DOOR (2ND FLOOR)		NEW	STANDBY	CONSTANT SPEED	5.0	HP	480	3	PB-81-01	N	Indoor
General Comments:	*ETAP TAG RUD-81.01*											
	ROLLUP DOOR 81 (EAST)		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-81-01	N	Indoor
General Comments:	*ETAP TAG RUD-81.01*											
SCR-81.325	WAS SCREEN 2	46_21_90	NEW	STANDBY	CONSTANT SPEED	5.0	HP	480	3	MCC-81	N	Indoor
SCR-81.305	WAS SCREEN 1	46_21_90	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-81	N	Indoor
General Comments:	*PROVIDE 15A CIRCUIT TO VCP. ETAP TAG PMP-81.321*											
EF-81.921	BLOWER ROOM EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	3.0	HP	480	3	MCC-81	N	Indoor
EF-81.922	BLOWER ROOM EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	3.0	HP	480	3	MCC-81	N	Indoor
EF-81.923	SCREENING ROOM EXHAUST FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	MCC-81	N	Indoor
General Comments:	*ROOF MOUNTED UPBLAST EXHAUST FAN*											
MAU-81.911	THCKNG BLDG MAKEUP AIR UNIT	23_83_05	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-81	N	Indoor

82 | DIGESTER CONTROL BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
	BRIDGE CRANE		NEW	DUTY	CONSTANT SPEED	10.0	HP	480	3	PB-82-01	N	Indoor
BMS-82.900	DIGESTER PUMPING BLDG BMS CONTROL PANEL		NEW	DUTY		20.0	AMP	120	1	LP-82-01	N	Indoor
EDR-82.001	DIGESTER 1 EFFLUENT VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	N	Indoor
EDR-82.003	DIGESTER 2 EFFLUENT VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-02	N	Indoor
EDR-82.005	DIGESTER 3 EFFLUENT VALVE		FUTURE	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	N	Indoor
EDR-82.105	BFP FEED PUMP SUCTION HEADER ISO VALVE 1		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

82 | DIGESTER CONTROL BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EDR-82.106	BFP FEED PUMP SUCTION HEADER ISO VALVE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	N	Indoor
EDR-82.107	BFP FEED PUMP SUCTION HEADER ISO VALVE 3		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-02	N	Indoor
EDR-82.108	BFP FEED PUMP SUCTION HEADER ISO VALVE 4		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-02	N	Indoor
EDR-82.111	BFP FEED PUMP 1 SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.115	BFP FEED PUMP 1 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.121	BFP FEED PUMP 2 SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.125	BFP FEED PUMP 2 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.131	BFP FEED PUMP 3 SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.135	BFP FEED PUMP 3 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.141	BFP FEED PUMP 4 SUCTION VALVE		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.145	BFP FEED PUMP 4 DISCHARGE VALVE		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.190	BFP FEED PUMP DISCHARGE HEADER ISO VALVE 1		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.192	BFP FEED PUMP DISCHARGE HEADER ISO VALVE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.194	BFP FEED PUMP DISCHARGE HEADER ISO VALVE 3		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.196	BFP FEED PUMP DISCHARGE HEADER ISO VALVE 4		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.205	MBT FEED PUMP SUCTION HEADER ISO VALVE 1		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.206	MBT FEED PUMP SUCTION HEADER ISO VALVE 2		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.207	MBT FEED PUMP SUCTION HEADER ISO VALVE 3		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.208	MBT FEED PUMP SUCTION HEADER ISO VALVE 4		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.211	MBT FEED PUMP 1 SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.215	MBT FEED PUMP 1 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.221	MBT FEED PUMP 2 SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.225	MBT FEED PUMP 2 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.231	MBT FEED PUMP 3 SUCTION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.235	MBT FEED PUMP 3 DISCHARGE VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.241	MBT FEED PUMP 4 SUCTION VALVE		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.245	MBT FEED PUMP 4 DISCHARGE VALVE		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.251	MBT TANK 1 ISO VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.252	MBT FEED PUMP DISCHARGE HEADER ISO VALVE 1		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.253	MBT TANK 2 ISO VALVE B		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.254	MBT TANK 2 ISO VALVE A		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-05	N	Indoor
EDR-82.255	MBT FEED PUMP DISCHARGE HEADER ISO VALVE 2		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
EDR-82.256	MBT TANK 3 ISO VALVE		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-04	N	Indoor
HP-82.943	DP BLDG HEAT PUMP 3		NEW	STANDBY		26.5	AMP	480	3	PB-82-01	N	Indoor
SF-82.931	STAIRWELL SUPPLY FAN	23_34_01	NEW	DUTY	CONSTANT SPEED	0.5	HP	120	1	LP-82-01	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

82 | DIGESTER CONTROL BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
TPV-82.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-82-01	N	Indoor
VCP-82.960	WATER PUMPS (3) FOR HEAT PUMPS	23_21_23	NEW	DUTY	VARIABLE SPEED	15.2	AMP	480	3	PB-82-01	N	Indoor
HP-82.942	DP BLDG HEAT PUMP 2		NEW	DUTY		26.5	AMP	480	3	PB-82-01	N	Indoor
HP-82.941	DP BLDG HEAT PUMP 1		NEW	DUTY		26.5	AMP	480	3	PB-82-01	N	Indoor
PPU-82.972	CONTROL ROOM PPU	23_41_51	NEW	DUTY	VARIABLE SPEED	1.5	HP	480	3	PB-82-01	N	Indoor
PPU-82.971	ELECTRICAL ROOM PPU	23_41_51	NEW	DUTY	VARIABLE SPEED	1.5	HP	480	3	PB-82-01	N	Indoor
EF-82.922	PUMP ROOM EXHAUST FAN 2	23_34_01	NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	MCC-82B	N	Indoor
General Comments:	*CENTRIFUGAL ROOF-MOUNTED UPBLAST EXHAUST FAN*											
	ROLLUP DOOR 82 (EAST)		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-82-01	N	Indoor
General Comments:	*ETAP TAG RUD-81.01*											
PMP-82.113	BFP FEED PUMP 1	43_23_57.10	NEW	DUTY	VARIABLE SPEED	30.0	HP	480	3	MCC-82A	N	Indoor
General Comments:	*ETAP TAG BFP-20.01*											
PMP-82.123	BFP FEED PUMP 2	43_23_57.10	NEW	DUTY	VARIABLE SPEED	30.0	HP	480	3	MCC-82A	N	Indoor
General Comments:	*ETAP TAG BFP-82.02*											
PMP-82.213	MBT FEED PUMP 1	43_23_57.10	NEW	DUTY	VARIABLE SPEED	25.0	HP	480	3	MCC-82A	N	Indoor
General Comments:	*ETAP TAG PMP-82.01*											
PMP-82.223	MBT FEED PUMP 2	43_23_57.10	NEW	DUTY	VARIABLE SPEED	25.0	HP	480	3	MCC-82A	N	Indoor
General Comments:	*ETAP TAG PMP-82.02*											
EF-82.921	PUMP ROOM EXHAUST FAN 1	23_34_01	NEW	DUTY	CONSTANT SPEED	0.8	HP	480	3	MCC-82A	N	Indoor
General Comments:	*CENTRIFUGAL ROOF-MOUNTED UPBLAST EXHAUST FAN*											
PMP-82.243	MBT FEED PUMP 4	43_23_57.10	FUTURE	DUTY	VARIABLE SPEED	25.0	HP	480	3	MCC-82B	N	Indoor
General Comments:	*ETAP TAG PMP-82.04*											
PMP-82.233	MBT FEED PUMP 3	43_23_57.10	NEW	STANDBY	VARIABLE SPEED	25.0	HP	480	3	MCC-82B	N	Indoor
General Comments:	*ETAP TAG PMP-82.03*											
PMP-82.143	BFP FEED PUMP 4	43_23_57.10	FUTURE	STANDBY	VARIABLE SPEED	30.0	HP	480	3	MCC-82B	N	Indoor
MAU-82.911	PUMP ROOM MAKEUP AIR UNIT	23_83_05	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	PB-82-01	N	Indoor
PMP-82.133	BFP FEED PUMP 3	43_23_57.10	NEW	STANDBY	VARIABLE SPEED	30.0	HP	480	3	MCC-82B	N	Indoor
General Comments:	*ETAP TAG BFP-20.03*											
MTS-82-01	MANUAL TRANSFER SWITCH		NEW	STANDBY	CONSTANT SPEED	225.0	AMP	480	3	MCC-82B	N	Indoor

83 | DIGESTER BLOWER BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
GUH-83.951	BLOWER ROOM GAS INFRA-RED TUBE HEATER	23_83_01	NEW	DUTY		5.5	AMP	120	1	LP-82-01	N	Indoor
GUH-83.952	BLOWER ROOM GAS INFRA-RED TUBE HEATER		NEW	DUTY		5.5	AMP	120	1	LP-82-01	N	Indoor
TPV-83.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-82-01	N	Indoor
VCP-83.122	DIGESTER BLOWER NO. 2 VENDOR CONTROL PANEL		NEW	DUTY		10.0	AMP	480	3	MCC-82A	N	Indoor
VCP-83.142	DIGESTER BLOWER NO. 4 VENDOR CONTROL PANEL		FUTURE	STANDBY		10.0	AMP	480	3	MCC-82B	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

83 | DIGESTER BLOWER BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
BLO-83.131	DIGESTER BLOWER 3	43_11_38	NEW	DUTY	VARIABLE SPEED	300.0	HP	480	3	SWG-82B	N	Indoor
EDR-83.135	DIGESTER BLOWER NO. 3 DISCHARGE ISOLATION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-02	Y	Indoor
BLO-83.111	DIGESTER BLOWER 1	43_11_38	NEW	DUTY	VARIABLE SPEED	300.0	HP	480	3	SWG-82A	N	Indoor
BLO-83.121	DIGESTER BLOWER 2	43_11_38	NEW	DUTY	VARIABLE SPEED	300.0	HP	480	3	SWG-82A	N	Indoor
BLO-83.141	DIGESTER BLOWER 4	43_11_38	FUTURE	STANDBY	VARIABLE SPEED	300.0	HP	480	3	SWG-82B	N	Indoor
EDR-83.125	DIGESTER BLOWER NO. 2 DISCHARGE ISOLATION VALVE		NEW	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	Y	Indoor
EDR-83.115	DIGESTER BLOWER NO. 1 DISCHARGE ISOLATION VALVE		NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	PB-82-03	Y	Indoor
EDR-83.145	DIGESTER BLOWER NO. 4 DISCHARGE ISOLATION VALVE		FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	PB-82-02	Y	Indoor
EF-83.922	BLOWER ROOM EXHAUST FAN 2	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-82B	Y	Indoor
General Comments:	*HOODED ROOF-MOUNTED EXHAUST FAN*											
EF-83.924	BLOWER ROOM EXHAUST FAN 4	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-82B	N	Indoor
	ROLLUP DOOR 83 (SOUTH)		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-82-01	N	Indoor
General Comments:	*ETAP TAG RUD-81.01*											
SF-83.932	BLOWER ROOM SUPPLY FAN 2	23_34_01	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-82B	N	Indoor
General Comments:	*FILTERED LOUVERED ROOM SUPPLY FAN*											
SF-83.934	BLOWER ROOM SUPPLY FAN 4	23_34_01	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-82B	N	Indoor
General Comments:	*FILTERED LOUVERED ROOF SUPPLY FAN*											
VCP-83.112	DIGESTER BLOWER NO. 1 VENDOR CONTROL PANEL		NEW	DUTY		10.0	AMP	480	3	MCC-82A	N	Indoor
VCP-83.132	DIGESTER BLOWER NO. 3 VENDOR CONTROL PANEL		NEW	DUTY		10.0	AMP	480	3	MCC-82B	N	Indoor
EF-83.921	BLOWER ROOM EXHAUST FAN 1	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-82A	Y	Indoor
General Comments:	*HOODED ROOF-MOUNTED EXHAUST FAN*											
EF-83.923	BLOWER ROOM EXHAUST FAN 3	23_34_01	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	MCC-82A	Y	Indoor
General Comments:	*HOODED ROOF-MOUNTED EXHAUST FAN*											
SF-83.931	BLOWER ROOM SUPPLY FAN 1	23_34_01	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-82A	N	Indoor
SF-83.933	BLOWER ROOM SUPPLY FAN 3	23_34_01	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-82A	N	Indoor
General Comments:	*FILTERED LOUVERED ROOF SUPPLY FAN*											

85 | DEWATERING BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
ALP-85.323	EMERGENCY SHOWER/EYEWASH STATION INSTANTANEOUS HOT WATER HEATER	22_42_01	NEW	DUTY		108.0	KW	480	3	PB-85-02	N	Indoor
BMS-85.900	DEWATERING BLDG BMS CONTROL PANEL		NEW	DUTY		20.0	AMP	120	1	LP-85-02	N	Indoor
DW-MISC	LIGHTING AND MISC. AT DEWATERING BUILDING		NEW	DUTY		15.0	KVA	208	3	LP-85-02	Y	Indoor
EDR-85.117	BFP1 MM ISO VALVE 1		NEW	STANDBY		1.0	HP	480	3	PB-85-02	N	Indoor
EDR-85.119	BFP1 MM ISO VALVE 2		NEW	STANDBY		1.0	HP	480	3	PB-85-02	N	Indoor
EDR-85.127	BFP2 MM ISO VALVE 1		NEW	STANDBY		1.0	HP	480	3	PB-85-02	N	Indoor
EDR-85.129	BFP2 MM ISO VALVE 2		NEW	STANDBY		1.0	HP	480	3	PB-85-02	N	Indoor

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

85 | DEWATERING BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
EF-85.921	POLYMER ROOM EXHAUST FAN		NEW	DUTY	CONSTANT SPEED	0.5	HP	120	1	LP-85-01	N	Indoor
FAN-86.810	BIOSOLIDS PAD FAN		NEW	DUTY	VARIABLE SPEED	2.0	HP	480	3	PB-85-01	N	Indoor
FAN-86.820	BIOSOLIDS PAD FAN		NEW	DUTY	VARIABLE SPEED	2.0	HP	480	3	PB-85-01	N	Indoor
FAN-86.830	BIOSOLIDS PAD FAN		NEW	DUTY	VARIABLE SPEED	2.0	HP	480	3	PB-85-01	N	Indoor
GUH-85.951	POLYMER ROOM GAS UNIT HEATER	23_83_01	NEW	DUTY		1.9	AMP	120	1	LP-85-02	N	Indoor
GUH-85.952	POLYMER ROOM GAS UNIT HEATER	23_83_01	NEW	DUTY		1.9	AMP	120	1	LP-85-02	N	Indoor
PMP-85.361	POLYMER ROOM SUBMERSIBLE PUMP 1	43_25_00.10	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	PB-85-01	N	Indoor
PMP-85.362	POLYMER ROOM SUBMERSIBLE PUMP 2	43_25_00.10	NEW	DUTY	CONSTANT SPEED	2.0	HP	480	3	PB-85-01	N	Indoor
TPV-85.001	ELECTRONIC TRAP PRIMER ASSEMBLY	22_42_01	NEW	DUTY	CONSTANT SPEED	0.3	AMP	120	1	LP-85-01	N	Indoor
	ROLLUP DOOR 85A (WEST)		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-85-02	N	Indoor
General Comments:	*ETAP TAG RUD-81.01*											
	ROLLUP DOOR 85B (MIDDLE)		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-85-02	N	Indoor
	ROLLUP DOOR 85C (EAST)		NEW	STANDBY	CONSTANT SPEED	0.8	HP	480	3	PB-85-01	N	Indoor
General Comments:	*ETAP TAG RUD-85.01*											
PPU-85.971	ELECT ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-85-01	N	Indoor
PPU-85.972	CNTRL ROOM POSITIVE PRESSURIZATION UNIT	23_41_51	NEW	DUTY	CONSTANT SPEED	1.5	HP	480	3	PB-85-01	N	Indoor
PMP-85.210	WASHWATER BOOSTER PUMP 1	46_76_21	NEW	DUTY	CONSTANT SPEED	20.0	HP	480	3	MCC-85	N	Indoor
PMP-85.111	HYDRAULIC PUMP 1	46_76_21	NEW	DUTY	VARIABLE SPEED	2.0	HP	480	3	MCC-85	Y	Indoor
MTR-85.112	FEED BOX PADDLE MOTOR	46_76_21	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	MCC-85	N	
MTR-85.113	GBT DRIVE	46_76_21	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	
MTR-85.114	PRESS 1M-1 DRIVE	46_76_21	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	
MTR-85.115	PRESS 1M-2 DRIVE	46_76_21	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	
PBU-85.330	POLYMER BLENDER UNIT 1	46_33_35	NEW	DUTY	VARIABLE SPEED	1.0	HP	120	1	LP-85-02	N	Indoor
PBU-85.340	POLYMER BLENDER UNIT 2	46_33_35	NEW	DUTY	VARIABLE SPEED	1.0	HP	120	1	LP-85-02	N	Indoor
PBU-85.350	POLYMER BLENDER UNIT 3	46_33_35	FUTURE	STANDBY	VARIABLE SPEED	1.0	HP	120	1	LP-85-02	N	Indoor
PMP-85.220	WASHWATER BOOSTER PUMP 2	46_76_21	NEW	DUTY	CONSTANT SPEED	20.0	HP	480	3	MCC-85	N	Indoor
PMP-85.121	HYDRAULIC PUMP 2	46_76_21	NEW	DUTY	VARIABLE SPEED	2.0	HP	480	3	MCC-85	Y	Indoor
MTR-85.122	FEED BOX PADDLE MOTOR	46_76_21	NEW	DUTY	CONSTANT SPEED	1.0	HP	480	3	MCC-85	N	
MTR-85.123	GBT DRIVE	46_76_21	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	
MTR-85.124	PRESS 2M-1 DRIVE	46_76_21	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	
MTR-85.125	PRESS 2M-2 DRIVE	46_76_21	NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	
PMP-85.230	WASHWATER BOOSTER PUMP 3	46_76_21	FUTURE	STANDBY	CONSTANT SPEED	20.0	HP	480	3	MCC-85	N	Indoor
PMP-85.131	HYDRAULIC PUMP 3	46_76_21	FUTURE	STANDBY	VARIABLE SPEED	2.0	HP	480	3	MCC-85	Y	Indoor
MTR-85.132	FEED BOX PADDLE MOTOR	46_76_21	FUTURE	STANDBY	CONSTANT SPEED	1.0	HP	480	3	MCC-85	N	
MTR-85.133	GBT DRIVE	46_76_21	FUTURE	STANDBY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	

Date/Time displayed in this report reflect time in PST

EQUIPMENT LIST REPORT

PROJECT INFORMATION

PROJECT [redacted]
CLIENT
PROJECT NUMBER
REPORT BY ANDREW REX
REPORT DATE 5/24/2017 6:30 PM

85 | DEWATERING BUILDING

TAG	DESCRIPTION	SPEC SECTION	STATUS	SERVICE	LOAD TYPE	LOAD VALUE	LOAD UNITS	VOLTS	PHASE	POWER SOURCE	GEN POWER	ENVIRONMENT
MTR-85.134	PRESS 3M-1 DRIVE	46_76_21	FUTURE	STANDBY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	
MTR-85.135	PRESS 3M-2 DRIVE	46_76_21	FUTURE	STANDBY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	
MIX-85.310	POLYMER TANK MIXER 1	46_41_12	NEW	DUTY	CONSTANT SPEED	3.0	HP	480	3	MCC-85	N	Indoor
MIX-85.320	POLYMER TANK MIXER 2	46_41_12	NEW	DUTY	CONSTANT SPEED	3.0	HP	480	3	MCC-85	N	Indoor
CON-85.410	DEWATERING BELT CONVEYOR		NEW	DUTY	CONSTANT SPEED	5.0	HP	480	3	MCC-85	N	Indoor
HP-85.941	DB HEAT PUMP 1		NEW	DUTY		19.7	AMP	480	3	PB-85-01	N	Indoor
VCP-85.960	WATER PUMPS (2) FOR HEAT PUMPS	23_21_23	NEW	DUTY		7.4	AMP	480	3	PB-85-01	N	Indoor
HP-85.942	DB HEAT PUMP 2		NEW	STANDBY		19.7	AMP	480	3	PB-85-01	N	Indoor
EF-85.922	DEWATERING BLDG FUME EXHAUST FAN	23_34_01	NEW	DUTY	VARIABLE SPEED	50.0	HP	480	3	MCC-85	N	Indoor
MAU-85.911	DEWATERING BLDG MAKEUP AIR UNIT	23_83_05	NEW	DUTY	VARIABLE SPEED	40.0	HP	480	3	MCC-85	N	Indoor
FAN-85.891	ODOR CONTROL FOUL AIR FAN 1	23_34_17	NEW	DUTY	VARIABLE SPEED	40.0	HP	480	3	MCC-85	N	Indoor
	General Comments: *FAN-85.991 IS NOW PART OF BID ALTERNATE.*											
FAN-85.892	ODOR CONTROL FOUL AIR FAN 2	23_34_17	NEW	DUTY	VARIABLE SPEED	40.0	HP	480	3	MCC-85	N	Indoor
	General Comments: *FAN-85.992 IS NOW PART OF BID ALTERNATE.*											
FAN-85.893	ODOR CONTROL FOUL AIR FAN 3	23_34_17	NEW	STANDBY	VARIABLE SPEED	40.0	HP	480	3	MCC-85	N	Indoor
	General Comments: *FAN-85.993 IS NOW PART OF BID ALTERNATE.*											

Date/Time displayed in this report reflect time in PST

APPENDIX H: Standards Example, Design Checklist

DESIGN CHECKLIST: ELECTRICAL

ELECTRICAL		
Motor Control Centers		
Designation:	Cutler Hammer	
Manufacturers:		
Communications:	DeviceNet	
Thermal Magnetic Breakers, not Motor Circuit Protectors		
Variable Frequency Drives - Low Voltage		
Manufacturers:	Cutler-Hammer	
Communications:	DeviceNet	
Fail-safe System		
Requirements:	None	
Philosophy for fail-safe systems?	System is dual power fed, Generator on site – load shed required	
Lightning Panels		
Manufacturers:	No preference	
Notes:	SPDs required at each panel	
Voltage Requirements:	240/120VAC – Some locations vary	
Conductors		
Color coding:	BYO	
Insulation Class:	THHN for control wires	
Labeling:	?	
Motor winding heaters		
Motors located inside:	No	
Motors located outside:	No	
Horsepower Constraints:	No	
Uninterruptible Power Supplies		
Manufacturer:	APC – On line units	
Location:	Centralized:	Centralized UPS in the control room□
	Distributed:	Distributed in PAC cabinets
Back-up Time:	15-20 Minutes	
Alarms:	Discrete Alarms	
Network communication:	None	
Disconnects		

APPENDIX H: Standards Example, Design Checklist

DESIGN CHECKLIST: ELECTRICAL

Process Motors:	Y	
HVAC:	Y	
Instruments:	N	
Position indication:	N	
Power Monitoring		
Designation:		
Manufacturers:	CH Power Expert.	
Network communications:	Ethernet is desired – CH communications is not Ethernet based.	
Desired Data:	Phase-Phase Voltage, KW, PF, Phase Current, No Harmonics.	
Locations:		
Generators and Power Failures		
Manufacturers:	Wakashaws 300KW – Qty 2	
Fuel Type:	Duel Fule – Natural gas and Methane	
Fuel Storage:	1000 Gal/Generator	
Network communications:	None	
Data:		
Secondary Power Source:		
Loss of power generator start:	Manual	
Return to primary power:	Manual	
Source Transfer Transition:	Open	Cogen
	Closed	?
Load shed requirements?		
Load shedding is required – Generators are not sized to pick up all plant loads		
Information from other specific loads (UV system, etc)?		
Lightning - Outdoor		
Outdoor lightning lamp style:	Metal halide	

APPENDIX H: Standards Example, Design Checklist

DESIGN CHECKLIST: ELECTRICAL

Does the client follow Dark Sky policy?	Yes
Is lighting required to walk around or to work in?	Yes
Lightning - Indoor	
Indoor lighting lamp style:	Metal halide
Emergency lights or battery backup in fixtures?	Yes Emergency lighting is deployed.
	Yes Night lights are used.
Conduit Systems	
List material preferences for corrosive areas:	PCS – Commonly used
	PVC – Commonly used
List material preferences for non-corrosive areas:	Aluminum - Optional for Exposed areas
	Galvanized steel – Commonly used
Duct bank Construction	
Separate manholes or hand holes for the following:	
480VAC, 120VAC and Analog:	Separate the 480VAC – Analog and discrete can share
	No
Electrical Safety Philosophy Isolated electrical rooms desired?	Isolated electrical rooms are desired
Remote control/racking capacity desired?	Needs to be determined
Arc resistant gear desired?	Needs to be determined
Infrared scanning windows desired? Needs to be determined	
Maintenance switches desired?	Needs to be determined
Discuss arc flash labeling requirements here:	Needs to be determined
Utility Coordination and Requirements	Xcel standards apply
Minimum HP where reduced voltage soft starts are required: None	

APPENDIX H: Standards Example, Design Checklist

DESIGN CHECKLIST: ELECTRICAL

Is there a power factor penalty?	Yes
Any installation requirements/details pertinent to the project?	No

APPENDIX I: Standards Example, Design Checklist

DESIGN CHECKLIST: FIELDBUS STANDARDS

FIELDBUS STANDARDS	
Digital Bus Field Networks	
DeviceNet:	[X]
EtherNet/IP:	[X]
Profibus DP:	[X]
Profibus PA:	[X]
Foundation H1:	☐
Foundation HSE:	☐
Other:	
Other:	
Communications Modules	
Prosoft:	
SST:	
Other:	
Other:	
Fieldgates	
Endress Hauser Fieldgate	
Repeaters	
Procentec Profihub	
Diagnostic Equipment	
Profitrace Software with mobile communication:	☐
Profitrace Control Panel hardware is desired:	☐
Procentic Diagnostic Module:	☐
Terminators	
Phoenix Contact (screw type DB):	
Procentec:	
Couplers	
CompactLogix:	☐
ENTPA:	☐
ControlLogix:	☐
P&F PowerHub:	☐
Profibus Component Accessories	
Multimaster Control:	ComSoft PRS Switch

APPENDIX I: Standards Example, Design Checklist

DESIGN CHECKLIST: FIELDBUS STANDARDS

Redundancy Media Module:	RLM
Fiber Transceivers:	Hirschman OZD
Terminations	
Valves Profibus DP:	Repeater
	Manufacturer Hub Hardwired connections
Valves Profibus PA:	
Standard PA Junction Box	
Eurofast Connections	
Hardwired	
Instrument Profibus DP	
Eurofast Connections	
Hardwired	
Instrument Profibus PA	
Standard PA Junction Box	
Eurofast Connections	
Hardwired	
Profibus DP Configuration	
Profibus DP networks connecting field devices will have the following busparameter settings. A baudrate of 187.5k should be used for all Profibus networks extending into the field. A baudrate of 187.5k will allow for electrical Profibus segment lengths of up to 3,250 feet and eliminates many of the noise issues in higher speed networks. Segments can be extended an additional 700 feet by reducing the baudrate to 93.75k. Reducing the baudrate below 93.75k offers no additional segment length and should only be done if there are significant noise issues or bit errors on the network.	
Primary Master Node Address – 1	
Secondary Master Node Address – 2	
Network Baudrate – 187.5k	
Slot Time (T_{SL}) – 1000	
Minimum Station Delay Responder (minT_{SDR}) – 11	
Maximum Station Delay Responder (maxT_{SDR}) – 800	
Quiet Time (T_{QUI}) – 9	
Setup Time (T_{SET}) – 95	
GAP Update Factor (G) – 10	
Highest Station Address (HSA) – 126	
Max Retry Limit – 5	

The values of T_{SL}, maxT_{SDR}, and T_{SET} must be configured to the above values when the Pepperl+Fuchs Power Hub DP/PA coupler is used. The GAP Update Factor must be set to 10 for multiple master networks, otherwise secondary masters will never be allowed to respond.	
When ABB S800 I/O is used, it will typically operate on its own Profibus DP network. If the only nodes on the network are S800 I/O, the default settings for CI854 modules should be used (differences shown below).	
Network Baudrate – 1.5M	
Slot Time (T_{SL}) – 300	
Maximum Station Delay Responder (maxT_{SDR}) – 150	
Quiet Time (T_{QUI}) – 0	
Setup Time (T_{SET}) – 20	
GAP Update Factor (G) – 1	
Max Retry Limit – 3	
Control Cabinet Standards	

APPENDIX J: Standards Example, Design Checklist

DESIGN CHECKLIST: GENERAL

General		Last Update:
Client Naming/Tagging Conventions:		
List tagging and loop number convention		See attached
Left to Right		X
Pilot Devices		
Control Station Controls Location:	Field:	X
	PTT	X – No transformer
	MCC/VFD	X – HIM modules
Pilot Light Types – located on Buckets	LED:	X
	Push to test:	X
Red:	Running	
Green:	Standby/Ready	
White:	Power On	
Blue:	2 speed - Run Slow	
Amber: Fail	Fault	
Packaged Equipment Preferences		
Packaged equipment with starters		
Sump Pumps		
Starter Location:	Field:	X
	MCC:	
Controls:	Plant:	
	Vendor:	X
Monitoring:	Plant PCS:	X
Level Element Type:	Floats:	X
HVAC Air Handling/Make up Air Units/Evaporative Coolers:		
Starter Location:	Field :	X
	MCC:	X
Controls:	Plant	Separate Controls – Soldyn MTEC
	Vendor	X
Monitoring	Plant PCS:	X

APPENDIX J: Standards Example, Design Checklist

DESIGN CHECKLIST: GENERAL

Fire Alarms		
Fire Alarm Control Panel:	X	
Third Party Monitored:	No	
Signal Type:	Traditional:	X
	Addressable:	
Security Alarms		
Security system control panel required?	N	
Third party vendor supported?	N	
Local panels:	N	
Card Access:	Entry Gate only – Staff doesn't like	
Security System Software		
N/A		
Security System Hardware		
CCTV: Internally controlled	Gate Monitoring Only	
Physical Installation Requirements:	No formal standards.	
Phone System		
Phone:	VOIP based, CISCO and Clarion	
Support:	City IT services	
Paging System		
Manufacturer:	City IT maintains phone system - Cisco	
	Maintenance takes care of paging system	
	Phone system controls through PAX	
System Requirements:	None.	
Energy Management System		
Manufacturer:	Nothing currently in place for management.	

APPENDIX J: Standards Example, Design Checklist

DESIGN CHECKLIST: GENERAL

Building Management	
Manufacturer:	Nothing in place.
Lightning Protection:	
Is lightning protection required?	Yes – Ground Rods and Ground Loop

APPENDIX K: Standards Example, Design Checklist

DESIGN CHECKLIST: INSTRUMENTATION

INSTRUMENTATION	Last Update:	
Instrument Preferences		
Digital Bus Required:	DeviceNet Motor Control – Instruments are pending	
FDT/DTM requirement for instruments?	Yes 4-20mA HART	
Flow Switches	No preference	
Flow Meters Coriolis:	No preference	
Flow Meters Thermal:	Sierra	
Flow Meters Magnetic:	Endress+Hauser 53W	
	Bypass preference	Spool piece X
	Spool piece material	PVC X - Typical
		Steel X – in special cases
Level Switches:	Standard Floats and Tuning Forks	
Level Ultrasonic instruments:	Endress+Hauser SP1, 4 wire, Integral (in most applications)	
Level Radar instruments:	No preferences	
Pressure Switches:	Ashcroft DPDT	
Pressure Gauges:	Ashcroft – 1279 Glycerin filled	
Pressure Transmitters:	Endress+Hauser Cerebar.	
DO:	Endress+Hauser	
pH:	Endress+Hauser	
ORP:	Endress+Hauser	
Turbidity:	HACH, Endress+Hauser	
Gas Detection:	Sierra Monitor Corp – Sentry Q with remote transmitter	
Analyzers:	Ammonia: Endress+Hauser ISOMax	Nitrate: Endress+Hauser ISOMax
Control Philosophy		
Two Wire (HOA) or three-wire (LOR+Start/Stop pushbuttons) controls desired?		
Three-wire control:	Yes	
Reset preferences:	Reset pushbuttons	
Interlocks		
Software:	Mostly Software	
Hardware:	Where required	
Device Networking Preferences		

APPENDIX K: Standards Example, Design Checklist

DESIGN CHECKLIST: INSTRUMENTATION

Need to evaluate on a project basis if applicable based on data needs or economic constraints.	
Non-Modulating valves:	
Modulating valves:	
MCC:	X
VFD:	X
Switchgear:	
Motor Protection Relays:	
Control Cabinet Standards	
Lighting inside control cabinets:	X
Automatically on as door opens :	X
Cabinet Temperature Monitoring:	Switch to start fans – not alarmed
Intrusion contacts:	No
Alarm horns:	Control Room Only
Alarm Strobes:	On buildings not panels
Control Panel Depths:	Colors: Red = Signal, Black = Hot, White = Neutral. Green = Ground Wire shall be stranded MTW
Panduit	Grey
Terminal Blocks	Screw Terminals
Analog Terminal Blocks	Fused (min Fuses), Disconnect and test point.
Discrete	Circuit Breaker
Surge Protection	SPD on panels and SPD on field instruments located outside
Control Panel Names	ACC-xx where xx = process area abbreviation
Ethernet Switches	Cisco IE3000 located in the ACC
Fiber Patch Panel	Located in ACC
Ventilation	Fan vents located on Top front corners on ACC
Wiring Standards:	Conductor Field Labeling: Tag Based
	Conductor Panel Labeling: TAG-S-1 (analog) TAG-C-! (discrete)
	25% spare I/O per card
Any specific layout standards:	25% spare rack space
	All spare I/O is wired to filed terminal blocks
Controller Preferences	
Existing system	GE based – Mainly GE RX3i

APPENDIX K: Standards Example, Design Checklist

DESIGN CHECKLIST: INSTRUMENTATION

Manufacturer preference	GE RX3i PAC 120VAC
Processor redundancy required?	Not typically but could vary based on the installation requirements

Power Supply Redundancy	
24 VDC:	X
UPS:	X
Fail contacts monitored:	Yes

I/O Standards: DI and DO:	
24 VDC	
120 VAC	
Isolated Inputs:	Yes
Isolated Outputs:	PLC cabinet X
Interposing relays location:	Relay Cabinet X
	Starter X
Analog Voltage	4-20mA
Communication protocol preference?	IP Backbone
	Modbus TCP
Field Networks:	Ethernet is desired

HMIs	
HMI required on PLCs?	iFix Proficy
HMI hardware preference?	No real preference – ACP may be desirable

PCS/SCADA Preferences:	
List applicable communication requirements: [Internal/External/Others]	Others?
	Thin client deployment is desired, Thick in control room.
Will the operator workstations have run-time, development or thin client licenses?	Large Process display screen
Any specific operator workstation requirements?	CCTV Display screen(s)
	Currently under review - Firewall exists between corporate in the plant but corporate controls the firewall

APPENDIX K: Standards Example, Design Checklist

DESIGN CHECKLIST: INSTRUMENTATION

List any currently deployed SCADA security measures like firewall rules etc.	Currently under review - Firewall exists between corporate in the plant but corporate controls the firewall
Virtualization Requirements:	iHistorian – potentially Thin Client Manager
SCADA Server Notes	Dual SCADA servers – not virtualized one on site and a second offsite. GE Webspace is used and located on the offsite server
Communication System Network	
List Internal and External Communication requirements:	Plant Corporate: VPN on T1
	Control System: VPN access
List network preferences for equipment:	Switches IT for large infrastructure
Equipment furnished by?	Cabinet switches by Contractor

APPENDIX L: CONDITION ASSESSMENT

Southeast Water Reclamation Facility (SEWRF)										
Visited 10/10-10/13/2016, 5/26/2017										
Equipment Description	**Location**	**Comments**	**Project Type (CIP, Maintenance)**	**Year of Install**	**Projected Replacement Year**	**Priority**	**Manufacturer**	**Condition**	**CIP Plans**	**Project**
RAS VFD-101	Main Electrical Room	Out of service during visit. Plans to fix and be put back into service.	CIP	2000	2018	Medium	Square D	Fair	MCC-9 & MCC-10 are high priority to replace, 18 years is a long life for a VFD, several panelboards are due for replacement. The PLC equipment should also be replaced, and doing that replacement at the same time as the MCCs it serves is a good way to save some cost and get an installation that is better-integrated.	RAS/WAS System Rehabilitation, 2018
RAS VFD-102	Main Electrical Room		CIP	2000	2018	Medium	Square D	Fair		
RAS VFD-103	Main Electrical Room		CIP	2000	2018	Medium	Square D	Fair		
WAS VFD-104	Main Electrical Room	VFD controller/maybe VFD has been replaced	CIP	2000	2018	Medium	Square D	Fair		
WAS VFD-105	Main Electrical Room		CIP	2000	2018	Medium	Square D	Fair		
WAS VFD-106	Main Electrical Room		CIP	2000	2018	Medium	Square D	Fair		
WAS VFD-107	Main Electrical Room	VFD controller/maybe VFD has been replaced	CIP	2000	2018	Medium	Square D	Fair		
MCC-9	Main Electrical Room	Inadequate short circuit rating, old, and failing breakers.	CIP	1987	2017	High	Westinghouse	Fair		
MCC-10	Main Electrical Room	Inadequate short circuit rating, old, and failing breakers.	CIP	1987	2017	High	Westinghouse	Poor		
SP-1 Electrical Building PLC Panel	Main Electrical Room	AB SLC 5/05 platform	CIP			High	Allen-Bradley	Obsolete		
MTS #3	Generator room		Maint	1989	2019	Low	Westinghouse	Fair		
Panel P1	Generator room		Maint	1989	2019	Low	Westinghouse	Fair		
MTS #4	Generator room		Maint	1989	2019	Low	Westinghouse	Good		
Panel LE	Generator room	Should maybe be replaced somewhat soon, due to old age	Maint	1989	2019	Low	Westinghouse	Fair		
Sub-panel LE	Generator room	Should maybe be replaced somehwat soon, due to old age	Maint	1989	2019	Low	Westinghouse	Fair		
Panel PFC	RAS/WAS PS	Rusted and old.	Maint	1989	2019	Low	Westinghouse	Poor		
Panel LFC	RAS/WAS PS	Rusted and old.	Maint	1989	2019	Low	Westinghouse	Poor		
Panel PC/TC-1	Generator room	Should maybe be replaced somehwat soon, due to old age	Maint	1989	2019	Low	Westinghouse	Fair		
Flocculator 1 panel	Flocculator Basins	Very rusted.	Maint	1989	2019	Low	Westinghouse	Poor		
Flocculator 2 panel	Flocculator Basins	Very rusted.	Maint	1989	2019	Low	Westinghouse	Poor		
Flocculator Control Panel	Flocculator Basins	Lots of rust, even though it is stainless steel.	Maint	1989	2019	Low		Poor		
XFMR LE	Generator room		Maint	1989	2019	n/a	Jefferson Electric	Fair	Dry-type transformers are good for the life of the building.	n/a
SWGR-1A/1B	Main Electrical Room	Hot spots found with thermal scan. At end of service life.	CIP	1986	2016	High	Westinghouse	Poor	The service entrance switchgear is in poor condition and is critical to the plant. The limited distribution of generator power through the switchgears and	Replace SWGR-1A/1B and Generator Switchgear, 2019

Generators 1&2 Switchgear	Main Electrical Room		CIP	1995	2025	Medium	ASCO	Good	complicated switching procedures is expensive and unreliable.	
Generators 2&3 Switchgear	Main Electrical Room		CIP	2001	2031	Medium	ASCO	Good		
MCC-5	Dewatering Building	Old, and many loads are no longer used. Replace w/ MCC or distribution panel.	CIP	1986	2016	High	Westinghouse	Poor	MCC-5 & MCC-6 are high priority to replace, 18 years is a long life for a VFD, several panelboards are due for replacement. The PLC equipment should also be replaced, and doing that replacement at the same time as the MCCs it serves is a good way to save some cost and get an installation that is better-integrated.	Replace MCC-5 & MCC-6 (and Arc Flash Mitigation), 2019
MCC-6	Dewatering Building	Old, and many loads are no longer used. Replace w/ MCC or distribution panel.	CIP	1987	2017	High	Westinghouse	Poor		
SP-4 Dewatering Building PLC Panel	Dewatering Building	AB SLC 5/05 platform					Allen-Bradley	Obsolete		
MTS-LD	Dewatering Building		Maint	1989	2019	Low	Westinghouse	Fair		
Panel LD	Dewatering Building	Old, latch is broken.	Maint	1989	2019	Low	Westinghouse	Fair		
MTS-LWH (mislabeled: LHW)	Headworks Elec Rm	Dirty, should be cleaned.	Maint	1989	2019	Low	Square D	Fair		
Panel-LWH (mislabeled: LHW)	Headworks Elec Rm	Dirty, should be cleaned.	Maint	1989	2019	Low	Square D	Fair		
Panel PC/TC	Headworks Elec Rm	Dirty, should be cleaned.	Maint	1989	2019	Low	Square D	Fair		
VFD-301	Sludge Building		CIP	2000	2030	Medium	Square D	Fair		
VFD-302	Sludge Building		CIP	2000	2030	Medium	Square D	Fair		
VFD-303	Sludge Building		CIP	2000	2030	Medium	Square D	Fair		
VFD-304	Sludge Building		CIP	2000	2030	Medium	Square D	Fair		
VFD-306	Sludge Building		CIP	2000	2030	Medium	Square D	Fair		
XFMR-LD	Dewatering Building		Maint	1989	2019	Low	Westinghouse	Good	Dry-type transformers are good for the life of the building.	n/a
XFMR-LWH (should be LHW)	Headworks Elec Rm	Dirty, should be cleaned.	Maint	1989	2019	Low	Square D	Good		
Aerator disconnects	Aeration Basins	Visible rust.	Maint	2000	2030	Low	Cutler-Hammer	Fair	Corrosion and premature failure has already been observed in conductors and motors on the basins - and 20 years is a long life for VFDs.	Anoxic Basins Mixer Replacements, 2020 (MLR pumps are being eliminated)
Anoxic Mixer disconnects	Aeration Basins	Visible rust.	Maint	2000	2030	Low		Fair		
Return Mixed Liquor VFDs	Aeration Basins	Cabinets are installed outside	CIP	2000	2020	Low	Yaskawa	Fair		
Belt Filter Press 1 Control Panel	Dewatering Building	Modified to run BFP3.	CIP	1989	2019	High	Ashbrook-Simon-Hartley	Poor	These are in terrible condition, with improvised changes in the panels to keep them running.	BFP Control Panels, 2022
Belt Filter Press 2 Control Panel	Dewatering Building		CIP	1989	2019	High	Ashbrook-Simon-Hartley	Poor		
Belt Filter Press 3 Control Panel	Dewatering Building	Doesn't work. Loads run out of CP for BFP1	CIP	1989	2019	High	Ashbrook-Simon-Hartley	Poor		
MCC-1	Headworks Elec Rm	Duplicate equipment tag.	CIP	2000	2030	Low	Cutler-Hammer	Good	SWGR-2A/B should be retired in 2030, and it could either be replaced by another switchgear assembly - or eliminated entirely, with additonal vertical sections being added to SWGR-1A/T/B. MCCs -1, -2, -3, and -4 should also be due for replacement in 2030, and the plant should also replace MCC-1A and MCC-2A to simplify the installation and save space in the small Headworks Electrical Room. Several panelboards will also be due for replacement at the same time.	Electrical System Upgrades, 2030
MCC-1A	Headworks Elec Rm		CIP	2013	2043	Low	Square D	Good		
MCC-2	Headworks Elec Rm	Main breaker C-phase lug was replaced after original burned.	CIP	2000	2030	Low	Cutler-Hammer	Good		
MCC-2A	Headworks Elec Rm		CIP	2013	2043	Low	Square D	Good		
MCC-3	Headworks Elec Rm	Screw is missing from door, and table obstructs front.	CIP	2000	2030	Low	Cutler-Hammer	Good		
MCC-4	Headworks Elec Rm		CIP	2000	2030	Low	Cutler-Hammer	Good		
MCC-7	Sludge Building		Maint	2000	2030	Low	Cutler-Hammer	Good		
MCC-8	Sludge Building		Maint	2000	2030	Low	Cutler-Hammer	Good		
MCC-11	Main Electrical Room		CIP	2000	2030	High	Cutler-Hammer	Good		
MCC-12	Main Electrical Room		CIP	2000	2030	High	Cutler-Hammer	Good		
SP-2 Headworks Building PLC Panel	Headworks Elec Rm	AB SLC 5/05 platform	CIP				Allen-Bradley	Obsolete		
SP-3 Sludge Building PLC Panel	Main Electrical Room	AB SLC 5/05 platform	CIP				Allen-Bradley	Obsolete		
MTS-L1	Main Electrical Room		Maint	2000	2030	Critical	Cutler-Hammer	Good		
Panel L1	Main Electrical Room		Maint	2000	2030	Critical	Cutler-Hammer	Good		
Panel P4	Main Electrical Room		Maint	2000	2030	High	Square D	Good		
Panel L4	Main Electrical Room		Maint	2000	2030	Low	Square D	Good		
Panel LDA	Dewatering Building		Maint	2000	2030	Low	Cutler-Hammer	Good		
MTS-L2	Headworks Elec Rm	Dirty, should be cleaned.	Maint	2000	2030	Low	Cutler-Hammer	Good		
Panel L2	Headworks Elec Rm	Dirty, should be cleaned.	Maint	2000	2030	Low	Cutler-Hammer	Good		
MTS-L3	Sludge Building		Maint	2000	2030	Medium	Cutler-Hammer	Good		
Panel L3	Sludge Building		Maint	2000	2030	Medium	Cutler-Hammer	Good		
PC/TC-3	Sludge Building		CIP	2000	2030	Medium	Cutler-Hammer	Good		
Sludge Blower 1 Control Panel	Sludge Building	Dirty, should be cleaned. Still works: "critical component"	CIP	1999	2029	Medium		Good		
Sludge Blower 2 Control Panel	Sludge Building	Dirty, should be cleaned. Still works: "critical component"	CIP	1999	2029	Medium		Good		
Sludge Blower 3 Control Panel	Sludge Building	Dirty, should be cleaned. Still works: "critical component"	CIP	1999	2029	Medium		Good		
Air Compressor disconnects	Air scour blower bldg.		Maint	2000	2030		Cutler-Hammer	Good		

APPENDIX L: CONDITION ASSESSMENT

Air Scour Blower disconnect	Air scour blower bldg.		Maint	2000	2030		Cutler-Hammer	Good		
EQ Blowers 1 and 2 Disconnect Switches	Headworks Elec Rm	Dirty, should be cleaned.	Maint	2000	2030	Low		Good		
SWGR-2A/2B	Main Electrical Room		CIP	2001	2031	Medium	Eaton	Good		
Cogen breaker (addl section on SWGR-2A/2B)	Main Electrical Room		CIP	2005	2035	Medium	Eaton	Good		
XFMR L1	Main Electrical Room	Dirty, should be cleaned.	Maint	2000	2030	High	Cutler-Hammer	Good	Dry-type transformers are good for the life of the building.	n/a
XFMR L2	Headworks Elec Rm	Dirty, should be cleaned.	Maint	2000	2030	Low	Cutler-Hammer	Good		
XFMR L3	Sludge Building		Maint	2000	2030	Medium	Cutler-Hammer	Good	Dry-type transformers are good for the life of the building.	n/a
XFMR L4	Main Electrical Room		Maint	2000	2030	Medium	Square D	Good		
VFD-305	Sludge Building		Maint	2013	2033	Low	Square D	Good	These VFDs are installed in a clean environment and have redundant units, to aiming for 20 years out of these units is reasonable.	VFD Replacements Project, 2033
VFD-307	Sludge Building		Maint	2013	2033	Low	Square D	Good		
VFD-308	Sludge Building		Maint	2013	2033	Low	Square D	Good		
HS Jockey Pump VFDs #1, 2	HSPS Room		CIP	2015	2035	Low	Yaskawa	Good	These VFDs are installed in a clean environment and have redundant units, to aiming for 20 years out of these units is reasonable.	MARS Equipment Replacements, 2035
HS Pumps VFDs #1, 2, 3, 4	HSPS Room		CIP	2015	2035	Low	Yaskawa	Good		
LS Pump VFDs #1, 2, 3, 4, 5	Main Electrical Room		CIP	2015	2035	Low	Yaskawa	Good		
SP-6 HSPS Room PLC Panel	HSPS Room	CompactLogix platform	CIP	2015	2035		Allen-Bradley	Good		
Generator #1	Generator room	Gen not exercised regularly. Maintainance questionable.	CIP	1995	2035	Low	Caterpillar	Fair	The vendor recommends 40-50 years for life expectancy.	Generator 1 Replacement, 2035
MCC-1BSD	Biosolids Dryer bldg.	Duplicate equipment tag.	CIP	2008	2038	Low	Allen-Bradley	Good	Plan to replace these together in 30 years.	Biosolids Equipment Replacements, 2038
Panel UPS	Biosolids Dryer bldg.	Missing a space cover so that bus bars are now visible	Maint	2008	2038	Low	Cutler-Hammer	Good		
Generator #2	Generator room	Gen not exercised regularly. Maintainance questionable.	CIP	1995	2025	Low	Caterpillar	Fair	The vendor recommends 40-50 years for life expectancy.	Generator 2 Replacement, 2045
Panel PC/TC-2	Headworks Elec Rm	Dirty, should be cleaned.	Maint	2016	2046	Low	Cutler-Hammer	Good	MCCs -13, -14, -SEP should be due for replacement in 2045. Several panelboards will also be due for replacement at the same time.	Electrical Equipment Replacements, 2045
MCC-SEP	SEP Station		CIP	2016	2046	Low		Good		
MCC-13	HSPS Room		CIP	2015	2045	High	Square D	Good		
MCC-14	HSPS Room		CIP	2015	2045	Medium	Square D	Good		
Panel A	Administrative Building		Maint	2015	2045	Low	Eaton	Good		
Panel B	Administrative Building		Maint	2015	2045	Low	Eaton	Good		
Panel C	Administrative Building		Maint	2015	2045	Low	Eaton	Good		
Panel H1	Administrative Building		Maint	2015	2045	Low	Eaton	Good		
Panel H2	Administrative Building		Maint	2015	2045	Low	Eaton	Good		
Panel M	Administrative Building		Maint	2015	2045	Low	Eaton	Good		
XFMR A	Administrative Building		Maint	2015	2045	Low	Eaton	Good		
Panel in oil storage bldg.	Oil Storage Building	Visible rust.	Maint	2008	2038	Low	Square D	Fair		
XFMR near oil storage bldg.	Oil Storage Building	Visible rust.	Maint	2008	2038	Low	Square D	Fair		
Generator #3	Generator room	Gen not exercised regularly. Maintainance questionable.	CIP	2001	2051	Low	Caterpillar	Fair	The vendor recommends 40-50 years for life expectancy, but this unit might be unnecessary.	Consider removal, rather than replacment

CONSULTANT COMPETITIVE NEGOTIATION ACT (CCNA)

AGREEMENT No. [ENTER NUMBER]

PROFESSIONAL SERVICES [ENTER TITLE]

between

MANATEE COUNTY (COUNTY)

and

[ENTER CONSULTANT NAME]

(CONSULTANT)

AGREEMENT FOR [INSERT TYPE OF SERVICE]

THIS AGREEMENT is made and entered into as of this _____ day of _____, 20____ ("Effective Date"), by and between **MANATEE COUNTY**, a political subdivision of the State of Florida, (**"COUNTY")**, with offices located at 1112 Manatee Avenue West, Bradenton, Florida 34205, and **[INSERT COMPANY NAME]**, a [<enter the state of incorproation> and identify if it is a Company, Corporation, Limited Liability Company, etc.], (**"CONSULTANT")** with offices located at [Insert address], and duly authorized to conduct business in the State of Florida. COUNTY and CONSULTANT are collectively referred to as the "Parties" and individually as "Party."

WHEREAS, CONSULTANT engages in the business of providing [INSERT TYPE OF SERVICE]; and

WHEREAS, COUNTY has determined that it is necessary, expedient and in the best interest of COUNTY to retain CONSULTANT to render the professional services described in this Agreement; and

WHEREAS, this Agreement is a result of CONSULTANT'S submission of a proposal in response to Request for Qualifications No. [INSERT RFP NUMBER] and COUNTY thereafter conducted a competitive selection process in accordance with the Manatee County Procurement Code and Florida Statute § 287.055.

NOW, THEREFORE, the COUNTY and CONSULTANT, in consideration of the mutual covenants, promises, and representations contained herein, the sufficiency of which is hereby acknowledged, the Parties hereto agree as follows:

ARTICLE 1. SCOPE OF SERVICES

CONSULTANT shall provide professional services as described in **Exhibit A**, Scope of Services ("Services"). "Task" as used in this Agreement, refers to particular categories/groupings of services specified in **Exhibit A.**

ARTICLE 2. EXHIBITS INCORPORATED

This Agreement consists of a primary contract and <number> exhibits, which are as follows:

Exhibit A Scope of Services
Exhibit B Fee Rate Schedule
Exhibit C Affidavit of No Conflict
Exhibit D Insurance and Bond Requirements

These Exhibits are attached hereto and are incorporated into this Agreement. In the event of a conflict between the terms and conditions provided in the Articles of this Agreement and any Exhibit, the provisions contained within these Articles shall prevail unless the Exhibit specifically states that it shall prevail.

ARTICLE 3. AGREEMENT TERM

A. This Agreement shall commence on the Effective Date and remain in force until all Work issued during the effective period of this Agreement is completed, unless terminated by COUNTY pursuant to Article 10, but not to exceed [insert number of years] years.

ARTICLE 4. COMPENSATION

A. Compensation payable to CONSULTANT for the Services and expenditures incurred in providing the Services specified in **Exhibit A** shall be as stated in **Exhibit B**.

B. Compensation to CONSULTANT shall be based on actual hours performed times fee rate of the individual performing the work, plus reimbursable expenses up to the maximum compensation authorized in **Exhibit B**

C. The fee rates specified in **Exhibit B** shall be the total compensation for Services and shall contain all costs to include salaries, office operation, transportation, equipment, overhead, general and administrative, incidental expenses, fringe benefits and operating margin.

ARTICLE 5. INVOICES AND TIME OF PAYMENT

A. Subject to the provisions of this Agreement, COUNTY shall pay CONSULTANT for the Services at a rate of compensation according to the deliverable payment schedule stated in **Exhibit B**.

B. COUNTY shall approve of all invoices prior to payment.

C. When CONSULTANT seeks payment for any deliverable or reimbursable expense, it shall provide COUNTY with an invoice that includes a description of authorized Services performed and/or expense incurred, and the total unpaid compensation CONSULTANT represents as being due and owing as of the invoice date. All invoices shall include the number which COUNTY shall assign to this Agreement and will be provided to CONSULTANT in writing, upon execution of this Agreement.

D. If any Task requires units of deliverables, such units must be received and accepted in writing by the COUNTY prior to payment.

E. COUNTY shall have forty-five (45) days from the receipt of an invoice seeking payment of fees or costs to either pay the invoice, or notify CONSULTANT that the deliverable, or any part thereof, is unacceptable, and/or that any asserted expense is not reimbursable.

F. COUNTY shall have the right to retain from any payment due CONSULTANT under this Agreement, an amount sufficient to satisfy any amount of liquidated damages due and owing to COUNTY by CONSULTANT on any other Agreement between CONSULTANT and COUNTY.

G. All costs of providing the Services shall be the responsibility of CONSULTANT, with the exception of reimbursement by COUNTY for costs deemed reimbursable in **Exhibit B**.

H. Any dispute between COUNTY and CONSULTANT with regard to the Services or CONSULTANT'S invoice shall be resolved pursuant to the dispute resolution procedures established by Manatee County Procurement Code and Article 12 of this Agreement.

ARTICLE 6. RESPONSIBILITIES OF CONSULTANT

A. CONSULTANT shall appoint an Agent with respect to the Services. CONSULTANT'S Agent shall have the authority to make representations on behalf of CONSULTANT, receive information, and interpret and define the needs of CONSULTANT and make decisions pertinent to Services covered by this Agreement. CONSULTANT'S Agent shall have the right to designate other employees of CONSULTANT to serve in his or her absence. CONSULTANT reserves the right to designate a different agent, provided that COUNTY is given advance written notice thereof.

B. CONSULTANT shall perform the Services in accordance with the terms and conditions of this Agreement.

C. CONSULTANT shall ensure that all employees assigned to render the Services are duly qualified, registered, licensed or certified to provide the Services required.

D. CONSULTANT shall be responsible for collecting all existing data required for the successful completion of each Task.

E. CONSULTANT shall not engage in any obligations, undertakings, contracts or professional obligations that create a conflict of interest, or even an appearance of a conflict of interest, with respect to the Services. CONSULTANT attests to this via an Affidavit of No Conflict, **Exhibit C**.

F. CONSULTANT shall be entitled to rely upon information provided from COUNTY. Information includes, but is not limited to, additional services, consultations, investigations, and reports necessary for the execution of CONSULTANT'S work under this Agreement. CONSULTANT shall be fully responsible for verifying, to the extent practicable, documents and information provided by COUNTY and identifying any obvious deficiencies concerning the documents and information provided. CONSULTANT shall notify COUNTY of any errors or deficiencies noted in such information provided and assist, to the extent practicable, COUNTY in the identification and resolution of same. CONSULTANT agrees to incorporate the provisions of this paragraph in any subcontract into which it might enter with reference to the Services.

G. CONSULTANT shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and other services furnished by CONSULTANT under this Agreement. CONSULTANT shall, without additional compensation, correct or revise any errors or deficiencies in its designs, drawings, specifications, and other services.

H. CONSULTANT shall maintain an adequate and competent staff of professionally qualified persons during the term of this Agreement for the purpose of rendering the required services hereunder. CONSULTANT shall not sublet, assign or transfer any services under this Agreement without prior written consent of COUNTY.

I. COUNTY may require in writing that CONSULTANT remove from the project any of CONSULTANT'S personnel that COUNTY determines to be incompetent, careless or otherwise objectionable. No claims for an increase in compensation or agreement term based on COUNTY'S use of this provision will be valid.

ARTICLE 7. RESPONSIBILITIES OF COUNTY

A. COUNTY shall, through its County Administrator, appoint an individual to serve as County Representative. The County Representative shall have the authority to transmit instructions, receive information, interpret and define the policy of COUNTY and make decisions pertinent to services covered by this Agreement. COUNTY reserves the right to designate a different County Representative, provided that CONSULTANT is given written notice thereof.

B. COUNTY shall make available, at no cost to CONSULTANT, information relative to the project that is useful in the performance of the Services.

C. COUNTY shall provide prompt notice to CONSULTANT whenever COUNTY observes or otherwise becomes aware of any defect in the performance of the Services under this Agreement.

D. COUNTY shall give careful and reasonable consideration to the findings and recommendations of CONSULTANT and shall respond and issue notices to proceed in a timely manner.

E. COUNTY personnel shall be available on a time-permitting basis, where required and necessary to assist CONSULTANT. The availability and necessity of said personnel to assist CONSULTANT shall be at the discretion of COUNTY.

F. COUNTY shall perform the responsibilities enumerated in this Article at no cost to CONSULTANT.

ARTICLE 8. COUNTY'S PROJECT MANAGER

The Project Manager shall be appointed to represent COUNTY in all technical matters pertaining to the Services. The Project Manager shall have the following responsibilities:

A. The examination of all reports, sketches, drawings, estimates, proposals, and any other documents provided by CONSULTANT.

B. Providing CONSULTANT written decisions of COUNTY'S approval or disapproval of these documents within a reasonable time.

C. Transmission of instructions, receipt of information, and interpretation of COUNTY policies

and decisions with respect to design, materials and other matters pertinent to the services provided under this Agreement.

D. Provide CONSULTANT with prompt written notice whenever COUNTY observes, or otherwise becomes aware of, any defects or changes necessary in a project.

ARTICLE 9. COUNTY OWNERSHIP OF WORK PRODUCT

The Parties agree that COUNTY shall have exclusive ownership of all reports, documents, designs, ideas, materials, reports, concepts, plans, creative works, and other work product developed for or provided to COUNTY in connection with this Agreement, and all patent rights, copyrights, trade secret rights and other intellectual property rights relating thereto (collectively "the Intellectual Property"). CONSULTANT hereby assigns and transfers all rights in the Intellectual Property to COUNTY. CONSULTANT further agrees to execute and deliver such assignments and other documents as COUNTY may later require to perfect, maintain and enforce COUNTY'S rights as sole owner of the Intellectual property, including all rights under patent and copyright law.

ARTICLE 10. TERMINATION OF AGREEMENT

A. TERMINATION FOR CAUSE:

1. COUNTY shall have the right, by written notice to CONSULTANT, to terminate this Agreement, in whole or in part, for failure to substantially comply with the terms and conditions of this Agreement, to include:

    a. Failure to provide products or Services that comply with the specifications herein or that fail to meet COUNTY'S performance standards;

    b. Failure to deliver the supplies or perform the Services within the time specified; or

    c. Progress that is at a rate that disrupts the overall performance of this Agreement.

2. Prior to termination for default, COUNTY shall provide adequate written notice to CONSULTANT, affording CONSULTANT the opportunity to cure the deficiencies or to submit a specific plan to resolve the deficiencies within ten (10) days (or the period specified in the notice) after receipt of the notice. Failure to adequately cure the deficiency shall result in termination action.

3. Such termination may also result in suspension or debarment of CONSULTANT in accordance with Manatee County's Procurement Ordinance, Chapter 2-26. CONSULTANT shall be liable for any damage to COUNTY resulting from CONSULTANT'S default of the Agreement.

4. In the event of termination of this Agreement, CONSULTANT shall be liable for any damage to COUNTY resulting from CONSULTANT'S default of this Agreement. This liability includes any increased costs incurred by COUNTY in completing performance under this Agreement.

5. In the event of termination by COUNTY for any cause, CONSULTANT shall not have any right or claim against COUNTY for lost profits or compensation for lost opportunities. After a receipt of COUNTY'S Notice of Termination and except as otherwise directed by COUNTY, CONSULTANT shall:

    a. Stop work on the date and to the extent specified;
    b. Terminate and settle all orders and subcontracts relating to the performance of the terminated work;
    c. Transfer all work in process, completed work, and other materials related to the terminated work as directed by COUNTY; and
    d. Continue and complete all parts of that work that have not been terminated.

B. TERMINATION WITHOUT CAUSE:

COUNTY may terminate this Agreement, in whole or in part, without cause. COUNTY shall provide CONSULTANT a written "Notice of Intent to Terminate" thirty (30) days prior to the date of termination. If this Agreement is terminated by the COUNTY without cause, CONSULTANT shall be entitled to payment for all Services performed to the satisfaction of the COUNTY and all expenses incurred under this Agreement prior to termination, less any costs, expenses or damages due to the failure of the CONSULTANT to properly perform pursuant to this Agreement. CONSULTANT shall not be entitled to any other compensation, including anticipated profits on unperformed Services.

ARTICLE 11. TRANSITION SERVICES UPON TERMINATION

Upon termination or expiration of this Agreement, CONSULTANT shall cooperate with COUNTY to assist with the orderly transfer of the Services to COUNTY. Prior to termination or expiration of this Agreement, COUNTY may require CONSULTANT to perform and, if so required, CONSULTANT shall perform, certain transition services necessary to shift the services of CONSULTANT to another provider or to COUNTY itself as described below (the "Transition Services"). The Transition Services may include but shall not be limited to:

A. Working with COUNTY to jointly develop a mutually agreed upon Transition Services plan to facilitate the termination of the services;

B. Executing the Transition Services plan activities;

C. Answering questions regarding the Services on an as-needed basis; and

D. Providing such other reasonable services needed to effectuate an orderly transition to a new Service provider or to COUNTY.

ARTICLE 12. DISPUTE RESOLUTION

A. Disputes shall be resolved in accordance with the Manatee County Purchasing Code (Chapter 2-26 of the Manatee County Code of Ordinances). Any dispute resolution constituting a material change in this Agreement shall not be final until an amendment to this Agreement has been approved and executed by the COUNTY.

B. CONSULTANT agrees it must exhaust all dispute resolution procedures set forth in Manatee County's Procurement Code prior to instituting any action in state or federal court or before any administrative agency or tribunal.

ARTICLE 13. COMPLIANCE WITH LAWS

All Services rendered or performed by CONSULTANT pursuant to the provisions of this Agreement shall be in compliance with all applicable local, state and federal laws and ordinances. CONSULTANT shall have and keep current at all times during the term of this Agreement all licenses and permits as required by law.

ARTICLE 14. NON-DISCRIMINATION

CONSULTANT shall not discriminate against any employee or applicant for employment because of race, color, sex, creed, national origin, disability or age, and will take affirmative action to ensure that all employees and applicants are afforded equal employment opportunities. Such action will be taken with reference to, but shall not be limited to, recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff or termination, rates of training or retraining (including apprenticeship and on-the-job training).

ARTICLE 15. MAINTENANCE OF RECORDS; AUDITS; LICENSES

A. CONSULTANT shall maintain records, accounts, property records, and personnel records in accordance with generally accepted accounting principles, as deemed necessary by COUNTY to assure proper accounting of funds and compliance with the provisions of this Agreement.

   CONSULTANT shall provide COUNTY all information, reports, records and documents required by this Agreement or by COUNTY ordinances, rules or procedures, or as needed by COUNTY to monitor and evaluate CONSULTANT'S performance. Such materials shall also be made available to COUNTY upon request for auditing purposes. Inspection or copying will occur during normal business hours, and as often as COUNTY may deem necessary. COUNTY shall have the right to obtain and inspect any audit pertaining to the performance of this Agreement or CONSULTANT made by any local, state or federal agency. To the extent such materials are in the possession of a third party, CONSULTANT must obtain them from that third party, or certify in writing to COUNTY why it was unable to do so. CONSULTANT shall retain all records and supporting documents related to this Agreement in accordance with all applicable laws, rules and regulations, and, at a minimum, retain all records and supporting documents related to this Agreement, except duplicate copies or drafts, for at least three (3) years after the termination date.

B. CONSULTANT shall obtain any licenses required to provide the Services and maintain full compliance with any licensure requirements. Copies of reports provided to or by any licensing or regulatory agency shall be forwarded to COUNTY within ten (10) days of receipt by CONSULTANT. CONSULTANT shall immediately notify COUNTY if the required licenses of any of its principles or agents working on this Agreement are terminated, suspended, revoked or are otherwise invalid and/or are no longer in good standing.

ARTICLE 16. PUBLIC RECORDS

Pursuant to Florida Statutes §119.0701, to the extent CONSULTANT is performing services on behalf of COUNTY, CONSULTANT shall:

A. Keep and maintain public records that would ordinarily be required by COUNTY to perform the service.

B. Upon request from COUNTY'S custodian of public records, provide COUNTY with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.

C. Ensure that public records that are exempt or confidential from public records disclosure requirements are not disclosed except as authorized by law for the duration of this Agreement and following completion of this Agreement if CONSULTANT does not transfer the records to COUNTY.

D. Upon completion of this Agreement, transfer, at no cost, to COUNTY all public records in possession of CONSULTANT or keep and maintain public records required by COUNTY to perform the service. If CONSULTANT transfers all public records to COUNTY upon completion of this Agreement, CONSULTANT shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If CONSULTANT keeps and maintains public records upon completion of this Agreement, CONSULTANT shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to COUNTY, upon request from COUNTY'S custodian of public records, in a format that is compatible with the information technology systems of COUNTY.

IF CONSULTANT HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO COUNTY'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

Phone: 941.742.5845
Email: lacy.pritchard@mymanatee.org

Mail or hand delivery:
Attn: Records Manager
1112 Manatee Avenue West
Bradenton, FL 34205

ARTICLE 17. INDEMNIFICATION

A. The CONSULTANT shall indemnify and hold harmless County, its officers, and employees from liabilities, damages, losses and costs, including but not limited to reasonable attorney's

fees, to the extent caused by negligence, recklessness, or intentionally wrongful conduct of the CONSULTANT, its personnel, design professionals and other persons employed or utilized by the CONSULTANT in the performance of this Agreement. Such indemnification shall include the payment of all valid claims, losses, and judgments of any nature whatsoever in connection therewith and the payment of all related fees and costs. County reserves the right to defend itself.

B. CONSULTANT shall indemnify, defend, save and hold harmless the COUNTY, its officers, and employees all third-party claims, liabilities, loss, or cause of action that the Services constitutes an infringement of any third-party intellectual property right(s), unless such claim is based on COUNTY'S wrongful or illegitimate use of the Services. The foregoing states the entire liability of CONSULTANT and the sole and exclusive remedy for COUNTY with respect to any third-party claim of infringement or misappropriation of intellectual property rights. Such indemnification shall include, but not be limited to, the payment of all valid claims, losses, and judgments of any nature whatsoever in connection therewith and the payment of all related fees and costs, including attorneys' fees.

ARTICLE 18. NO WAIVER OF SOVEREIGN IMMUNITY

Nothing herein shall be interpreted as a waiver by COUNTY of its rights, including the limitations of the waiver of immunity as set forth in Florida Statutes § 768.28, or any other statutes or immunities. COUNTY expressly reserves these rights to the full extent allowed by law.

ARTICLE 19. INSURANCE

A. CONSULTANT shall, at its own cost and expense, acquire and maintain (and cause any subcontractors, representatives, or agents to acquire and maintain) insurance policies that comply with the Insurance Requirements, attached as **Exhibit D**, during the term of this Agreement, to include any renewal terms.

Certificates of Insurance and copies of policies evidencing the insurance coverage specified in **Exhibit D** shall be filed with the Purchasing Official before the Effective Date of this Agreement. The required certificates shall identify the type of policy, policy number, date of expiration, amount of coverage, companies affording coverage, shall refer specifically to the title of this Agreement, and shall name Manatee County as an additional insured. No changes shall be made to the insurance coverage without prior written approval by COUNTY'S Risk Management Division.

B. Insurance shall remain in force for at least three (3) years after completion of the Services in the amounts and types of coverage as required by **Exhibit D**, including coverage for all Services completed under this Agreement.

C. If the initial insurance expires prior to the termination of this Agreement, renewal Certificates of Insurance and required copies of policies shall be furnished by CONSULTANT and delivered to the Purchasing Official thirty (30) days prior to the date of their expiration.

ARTICLE 20. SOLICITATION OF AGREEMENT

CONSULTANT warrants that it has not employed or retained any company or person other than

a bona fide employee working solely for CONSULTANT to solicit or secure this Agreement, and that it has not paid or agreed to pay any company or person other than an employee working solely for CONSULTANT, any fee, commission, percentage, brokerage fee, gift, contingent fee, or any other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, COUNTY shall have the right to terminate this Agreement without liability, or at its discretion, to deduct from this Agreement price or consideration or otherwise recover the full amount of such fee, commission, percentage, brokerage fee, gifts, or contingent fee.

ARTICLE 21. ASSIGNMENT AND SUBCONTRACTING

CONSULTANT shall not assign or transfer any right or duty under this Agreement to any other party without the prior written consent of COUNTY. In the event CONSULTANT asserts it is necessary to utilize the services of third parties to perform any Service under this Agreement, CONSULTANT shall first obtain prior written approval of COUNTY.

Approval to utilize any third party shall not relieve CONSULTANT from any direct liability or responsibility to COUNTY pursuant to the provisions of this Agreement, or obligate COUNTY to make any payments other than payments due to CONSULTANT as outlined in this Agreement. All terms and conditions of this Agreement shall extend to and be binding on any approved purchaser, assignee, or other successor in interest.

Assignment, pledging, sale, transfer or encumbering of any interest or rights under this Agreement, to anyone other than the CONSULTANT, without the prior written consent of the COUNTY, shall be grounds for immediate termination of this Agreement.

ARTICLE 22. CERTIFICATION OF NON-PAYMENT OF COMMISSION OR GIFT

CONSULTANT warrants that it has not employed or retained any company or person other than a bona fide employee working solely for CONSULTANT to solicit or secure this Agreement, and that it has not paid or agreed to pay any company or person other than an employee working solely for CONSULTANT, any fee, commission, percentage, brokerage fee, gift, contingent fee, or any other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, COUNTY shall have the right to annul this Agreement, without liability or at its discretion to deduct from the agreement price consideration or otherwise recover the full amount of such fee, commission, percentage, brokerage fee, gifts, or contingent fee.

ARTICLE 23. KEY PERSONNEL

The following key personnel are hereby assigned to this Agreement by CONSULTANT:

Enter Name, Title

CONSULTANT shall not remove such key personnel from providing the Services; provided, however, that the removal of such personnel due to their incapacity, voluntary termination, or termination due to just cause will not constitute a violation of this Agreement. The COUNTY will require that, at a minimum, any proposed replacement have equal or greater qualifications and experience as the key personnel being replaced. CONSULTANT shall not make any personnel

changes of the key personnel until written notice is made to and approved by the COUNTY.

ARTICLE 24. SUB-CONTRACTOR

If CONSULTANT receives written approval from the COUNTY to use the services of a sub-contractor(s), CONSULTANT shall utilize the sub-contractor fees specified in **Exhibit B**. CONSULTANT shall notify COUNTY of any replacements or additions to **Exhibit B** and receive prior written approval of COUNTY for replacements or additions before the use of the sub-contractor.

ARTICLE 25. PROFESSIONAL LIABILITY

To the fullest extent allowed by law, the individuals performing the Services shall be personally liable for negligent acts or omissions. To the fullest extent allowed by law, CONSULTANT shall likewise be liable for negligent acts or omissions in the performance of the Services.

ARTICLE 26. NOTICES

All notices, requests and authorizations provided for herein shall be in writing and shall be delivered by hand or mailed through the U.S. Mail, addressed as follows:

To COUNTY:
Manatee County Government
Department
Attn: Title
Name
Address
City, State, Zip
Phone: (941)
Email:

To CONSULTANT:
Consultant Name
Attn: Representative Name
Address
City, State, Zip
Phone: ( )
Email:

ARTICLE 27. RELATIONSHIP OF PARTIES

The relationship of CONSULTANT to COUNTY shall be that of an independent contractor. Nothing herein contained shall be construed as vesting or delegating to CONSULTANT or any of the officers, employees, personnel, agents, or sub-consultants of CONSULTANT any rights, interest or status as an employee of COUNTY. COUNTY shall not be liable to any person, firm or corporation that is employed by Agreements or provides goods or services to CONSULTANT in connection with this Agreement or for debts or claims accruing to such parties. CONSULTANT shall promptly pay, discharge or take such action as may be necessary and reasonable to settle such debts or claims.

ARTICLE 28. NO CONFLICT

By accepting award of this Agreement, CONSULTANT, its directors, officers and employees, represents that it presently has no interest in and shall acquire no interest in any business or activity which would conflict in any manner with the performance of the Services.

ARTICLE 29. ETHICAL CONSIDERATIONS

CONSULTANT recognizes that in rendering the Services, CONSULTANT is working for the residents of Manatee County, Florida, subject to public observation, scrutiny and inquiry; and based upon said recognition CONSULTANT shall, in all of its relationships with COUNTY pursuant to this Agreement, conduct itself in accordance with all of the recognized applicable ethical standards set by any related national societies, and the reasonable traditions to perform the Services. CONSULTANT shall be truthful in its communications with COUNTY personnel regarding matters pertaining to this Agreement and the Services rendered to COUNTY.

ARTICLE 30. PUBLIC ENTITY CRIMES

CONSULTANT has been made aware of the Florida Public Entity Crimes Act, Florida Statutes § 287.133, specifically section 2(a), and COUNTY'S requirement that CONSULTANT comply with it in all respects prior to and during the term of this Agreement.

ARTICLE 31. TAXES

COUNTY is exempt from Federal Excise and State Sales Taxes (F.E.T. Exemption Certificate No. 59-78-0089K; FL Sales Tax Exemption Certificate No. 51-02-027548-53C). Therefore, CONSULTANT is prohibited from charging or imposing any sales or service taxes. Nothing herein shall affect CONSULTANT'S normal tax liability.

CONSULTANT shall be responsible for payment of federal, state, and local taxes which may be imposed upon CONSULTANT under applicable law to the extent that CONSULTANT is responsible for the payment of same under applicable law.

ARTICLE 32. FORCE MAJEURE

Neither Party shall be considered in default in performance of its obligations hereunder to the extent that performance of such obligations or any of them is delayed or prevented by Force Majeure.

Force Majeure shall include, but not be limited to, hostility, revolution, civil commotion, strike, epidemic, accident, fire, flood, wind, earthquake, hurricane, explosion, lack of or failure of transportation facilities, any law, proclamation, regulation, ordinance or other act of government, or any act of God or any cause whether of the same or different nature, existing or future; provided that the cause, whether or not enumerated in this Article, is beyond the control and without the fault or negligence of the Party seeking relief under this Article.

ARTICLE 33. GOVERNING LAW, JURISDICTION AND VENUE

This Agreement shall be governed by the laws of the State of Florida. Any action filed regarding this Agreement will be filed only in Manatee County, Florida, or if in Federal Court, the Middle District of Florida, Tampa Division.

ARTICLE 34. ATTORNEY FEES

In the event of any litigation arising under the terms of this Agreement, each Party shall be responsible for their own attorney's fees, including appellate fees, regardless of the outcome of the litigation.

ARTICLE 35. PATENT AND COPYRIGHT RESPONSIBILITY

Any material, design or supplied specified by CONSULTANT or supplied by CONSULTANT pursuant to this Agreement shall not knowingly infringe any patent or copyright, and CONSULTANT shall be solely responsible for securing any necessary licenses required for patented or copyrighted material utilized by CONSULTANT in the performance of the Services.

ARTICLE 36. AMENDMENTS

This Agreement and Exhibits referenced herein constitute the entire Agreement between the Parties with respect to subject matter and mutually agree that no verbal agreements, representations, warranties or other understandings affecting the same exist. No amendment hereof shall be effective until and unless reduced to writing and executed by the Parties. The Parties shall execute any additional documents as may be necessary to implement and carry out the intent of this Agreement.

ARTICLE 37. SEVERABILITY

It is understood and agreed by the Parties hereto that if any part, term, or provision of this Agreement is held to be illegal or in conflict with any law, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the Parties shall be construed and enforced as if this Agreement did not contain the particular part, term or provision held to be invalid.

ARTICLE 38. LEGAL REFERENCES

All references to statutory sections or chapters shall be construed to include subsequent amendments to such provisions, and to refer to the successor provision of any such provision. References to “applicable law” and “general law” shall be construed to include provisions of local, state and federal law, whether established by legislative action, administrative rule or regulation, or judicial decision.

ARTICLE 39. HEADINGS, CONSTRUCTION

The Parties agree that they have each participated in the drafting of this Agreement and that the rules with respect to construing ambiguities against the drafter of a contract shall not apply in any action or litigation regarding this Agreement. All articles and descriptive headings of paragraphs of this Agreement are inserted for convenience only and shall not affect the construction or interpretation hereof.

ARTICLE 40. TIME

For purposes of computing any period of number of days hereunder for notices or performance of ten (10) days or less, Saturdays, Sundays and holidays shall be excluded, unless otherwise stated.

ARTICLE 41. E-VERIFY

The CONSULTANT, and any subcontractor thereof, shall register with and use the E-Verify system to verify the work authorization status of all new employees of the CONSULTANT or subcontractor. The CONSULTANT hereby represents and warrants that it has, and shall remain throughout the duration of this Agreement, registered with, and uses and shall continue to use, the E-Verify system. The CONSULTANT shall not enter into any contract with a subcontractor for services hereunder unless such subcontractor also has registered with and uses the E-Verify system. If the CONSULTANT enters into a contract with a subcontractor, the subcontractor shall provide the CONSULTANT with an affidavit stating that the subcontractor does not employ, contract with, or subcontract with an unauthorized alien. The CONSULTANT shall maintain a copy of such affidavit for the duration of this Agreement.

Pursuant to Section 488.095(5)(c)3, Florida Statutes, the COUNTY is authorized to terminate this Agreement if it has a good faith belief that the CONSULTANT has knowingly violated Section 448.09(1), Florida Statutes, regarding the employment of someone not authorized to work by the immigration laws of the United States, the U.S. Attorney General, or the Secretary of the Department of Homeland Security. Such termination action is not considered a breach of contract.

ARTICLE 42. FUNDS FOR IDENTIFICATION DOCUMENTS

No funds provided by the COUNTY pursuant to this Agreement shall be used for the purpose of issuing an identification card or document to an individual who does not provide proof of lawful presence in the United States.

ARTICLE 43. AUTHORITY TO EXECUTE

Each of the Parties hereto covenants to the other Party that it has lawful authority to enter into this Agreement.

[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be duly executed effective as of the date set forth above.

CONSULTANT NAME

By: _____

Printed Name: _____

Title: _____

Date: _____

MANATEE COUNTY, a political subdivision of the State of Florida

_____
INSERT PURCHASING OFFICIAL
Purchasing Official

Date: _____

EXHIBIT A, SCOPE OF SERVICES

EXHIBIT B, FEE RATE SCHEDULE

1. FEES

Fees for the Services detailed in this Agreement shall be as set forth in this **Exhibit B**.

2. REIMBURSEABLE EXPENSES

[Remainder of page intentionally left blank]

EXHIBIT C, AFFIDAVIT OF NO CONFLICT

STATE OF _____
COUNTY OF _____

BEFORE ME, the undersigned authority, this day personally appeared [INSERT NAME] _____ _____, as [INSERT TITLE] _____ of [INSERT CONSULTANT NAME] _____ (hereinafter "CONSULTANT") with full authority to bind, who being first duly sworn, deposes and says that CONSULTANT:

(a) Is not currently engaged and will not become engaged in any obligations, undertakings or contracts that will require CONSULTANT to maintain an adversarial role against the County or that will impair or influence the advice, recommendations or quality of work provided to the County; and

(b) Has provided full disclosure of all potentially conflicting contractual relationships and full disclosure of contractual relationships deemed to raise a question of conflict(s); and

(c) Has provided full disclosure of prior work history and qualifications that may be deemed to raise a possible question of conflict(s).

CONSULTANT makes this Affidavit for the purpose of inducing Manatee County, a political subdivision of the State of Florida, to enter into this Agreement No. _____
for _____

DATED this _____ day of _____, 20_____.

_____
CONSULTANT Signature

The foregoing instrument was sworn to and acknowledged before me this _____ day of _____ _____, 20____, by [NAME]_____, as [TITLE] _____ _____ of [CONSULTANT]_____. He / She is personally known to me or has produced _____ [TYPE OF IDENTIFICATION] as identification.

_____
Notary Signature
Commission No. _____

EXHIBIT D, INSURANCE AND BOND REQUIREMENTS

REQUIRED INSURANCES

The CONSULTANT will not commence work under the resulting Agreement until all insurance coverages indicated by an "X" herein have been obtained. The CONSULTANT shall obtain and submit to the Procurement Division within ten (10) calendar days from the date of notice of intent to award, at its expense, the following minimum amounts of insurance (inclusive of any amounts provided by an umbrella or excess policy): Work under this Agreement cannot commence until all insurance coverages indicated herein have been obtained on a standard ACORD form (inclusive of any amounts provided by an umbrella or excess policy):

☒ **Automobile Liability Insurance Required Limits**

Coverage must be afforded under a per occurrence policy form including coverage for all owned, hired and non-owned vehicles for bodily injury and property damage of not less than:

- $1,000,000 Combined Single Limit; OR
- $ 500,000 Bodily Injury and $500,000 Property Damage
- $10,000 Personal Injury Protection (No Fault)
- $500,000 Hired, Non-Owned Liability
- $10,000 Medical Payments

This policy shall contain severability of interests' provisions.

☒ **Commercial General Liability Insurance Required Limits (per Occurrence form only; claims-made form is not acceptable)**

Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name 'Manatee County, a political subdivision of the State of Florida' as an Additional Insured, and include limits not less than:

- $1,000,000 Single Limit Per Occurrence
- $2,000,000 Aggregate
- $1,000,000 Products/Completed Operations Aggregate
- $1,000,000 Personal and Advertising Injury Liability
- $50,000 Fire Damage Liability
- $10,000 Medical Expense, and
- $1,000,000, Third Party Property Damage
- $ Project Specific Aggregate (Required on projects valued at over $10,000,000)

This policy shall contain severability of interests' provisions.

☒ **Employer's Liability Insurance**

Coverage limits of not less than:

- $100,000 Each Accident
- $500,000 Disease Each Employee
- $500,000 Disease Policy Limit

☒ Worker's Compensation Insurance

☐ **US Longshoremen & Harbor Workers Act**
☐ **Jones Act Coverage**

Coverage limits of not less than:

- Statutory workers' compensation coverage shall apply for all employees in compliance with the laws and statutes of the State of Florida and the federal government.
- If any operations are to be undertaken on or about navigable waters, coverage must be included for the US Longshoremen & Harbor Workers Act and Jones Act.

Should 'leased employees' be retained for any part of the project or service, the employee leasing agency shall provide evidence of Workers' Compensation coverage and Employer's Liability coverage for all personnel on the worksite and in compliance with the above Workers' Compensation requirements. NOTE: Workers' Compensation coverage is a firm requirement. Elective exemptions are considered on a case-by-case basis and are approved in a very limited number of instances.

☐ **Aircraft Liability Insurance Required Limits**
Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name 'Manatee County a political subdivision of the State of Florida' as an Additional Insured, and include limits not less than:

- $ Each Occurrence Property and Bodily Injury with no less than $100,000 per passenger each occurrence or a 'smooth' limit.
- $ General Aggregate.

☐ **Un-Manned Aircraft Liability Insurance (Drone)**
Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name 'Manatee County a political subdivision of the State of Florida' as an Additional Insured, and include limits not less than:

- $ Each Occurrence Property and Bodily Injury; Coverage shall specifically include operation of Unmanned Aircraft Systems (UAS), including liability and property damage.
- $ General Aggregate

☐ **Installation Floater Insurance**
When the contract or agreement **does not** include construction of, or additions to, above ground building or structures, but does involve the installation of machinery or equipment, Installation Floater Insurance shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- 100% of the completed value of such addition(s), building(s), or structure(s)

☒ **Professional Liability and/or Errors and Omissions (E&O) Liability Insurances**

Coverage shall be afforded under either an occurrence policy form or a claims-made policy form. If the coverage form is on a claims-made basis, then coverage must be maintained for a minimum of three years from termination of date of the contract. Limits must not be less than:

- $ 1,000,000 Bodily Injury and Property Damage Each Occurrence
- $ 2,000,000 General Aggregate

☐ **Builder's Risk Insurance**

When the contract or agreement includes the construction of roadways and/or the addition of a permanent structure or building, including the installation of machinery and/or equipment, Builder's Risk Insurance shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- An amount equal to 100% of the completed value of the project, or the value of the equipment to be installed
- The policy shall not carry a self-insured retention/deductible greater than $10,000

Coverage shall be for all risks and include, but not be limited to, storage and transport of materials, equipment, supplies of any kind whatsoever to be used on or incidental to the project, theft coverage, and Waiver of Occupancy Clause Endorsement, where applicable.

☐ **Cyber Liability Insurance**

Coverage shall comply with Florida Statute 501.171, shall be afforded under a per occurrence policy form, policy shall be endorsed and name 'Manatee County, a political subdivision of the State of Florida' as an Additional Insured, and include limits not less than:

- $ Security Breach Liability
- $ Security Breach Expense Each Occurrence
- $ Security Breach Expense Aggregate
- $ Replacement or Restoration of Electronic Data
- $ Extortion Threats
- $ Business Income and Extra Expense
- $ Public Relations Expense

NOTE: Policy must not carry a self-insured retention/deductible greater than $25,000.

☐ **Hazardous Materials Insurance (As Noted Below)**

Hazardous materials include all materials and substances that are currently designated or defined as hazardous by the law or rules of regulation by the State of Florida or federal government.

All coverage shall be afforded under either an occurrence policy form or a claims-made policy form, and the policy shall be endorsed and name 'Manatee County, a political subdivision of the State of Florida' as an Additional Insured. If the coverage form is on a claims-made basis, then coverage must be maintained for a minimum of three years from termination of date of the contract.

Limits must not be less than:

☐ ***Pollution Liability***
Amount equal to the value of the contract, subject to a $1,000,000 minimum, for Bodily Injury and Property Damage to include sudden and gradual release, each claim and aggregate.

☐ ***Asbestos Liability (If handling within scope of Contract)***
Amount equal to the value of the contract, subject to a $1,000,000 minimum, for Bodily Injury and Property Damage to include sudden and gradual release, each claim and aggregate.

☐ ***Disposal***
When applicable, CONSULTANT shall designate the disposal site and furnish a Certificate of Insurance from the disposal facility for Environmental Impairment Liability Insurance covering liability.

- Amount equal to the value of the contract, subject to a $1,000,000 minimum, for Liability for Sudden and Accidental Occurrences, each claim and an aggregate.
- Amount equal to the value of the contract, subject to a $1,000,000 minimum, for Liability for Non-Sudden and Accidental Occurrences, each claim and an aggregate.

☐ **Hazardous Waste Transportation Insurance**
CONSULTANT shall designate the hauler and have the hauler furnish a Certificate of Insurance for Automobile Liability insurance with Endorsement MCS-90 for liability arising out of the transportation of hazardous materials. EPA identification number shall be provided.

All coverage shall be afforded under either an occurrence policy form or a claims-made policy form and the policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured. If the coverage form is on a claims-made basis, then coverage must be maintained for a minimum of three years from termination of date of the contract. Limits must not be less than:

- Amount equal to the value of the contract, subject to a $1,000,000 minimum, per accident.

☐ **Liquor Liability Insurance**
Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- $1,000,000 Each Occurrence and Aggregate

☐ **Garage Keeper's Liability Insurance**
Coverage shall be required if the maintenance, servicing, cleaning or repairing of any County motor vehicles is inherent or implied within the provision of the contract.

Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and

include limits not less than:

- Property and asset coverage in the full replacement value of the lot or garage.

☐ **Bailee's Customer Liability Insurance**
Coverage shall be required for damage and/or destruction when County property is temporarily under the care or custody of a person or organization, including property that is on, or in transit to and from the person or organization's premises. Perils covered should include fire, lightning, theft, burglary, robbery, explosion, collision, flood, earthquake and damage or destruction during transportation by a carrier.

Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- Property and asset coverage in the full replacement value of the County asset(s) in the CONSULTANT'S care, custody and control.

☐ **Hull and Watercraft Liability Insurance**
Coverage shall be afforded under a per occurrence policy form, policy shall be endorsed and name "Manatee County, a political subdivision of the State of Florida" as an Additional Insured, and include limits not less than:

- $ Each Occurrence
- $ General Aggregate
- $ Fire Damage Liability
- $10,000 Medical Expense, and
- $ Third Party Property Damage
- $ Project Specific Aggregate (Required on projects valued at over $10,000,000)

☐ **Other [Specify]**

REQUIRED BONDS

☐ **Bid Bond**
A Bid Bond in the amount of $_____ or ____% of the total offer. Bid bond shall be submitted with the sealed response and shall include project name, location, and / or address and project number. In lieu of the bond, the bidder may file an alternative form of security in the amount of $_____ or ____% of the total offer. in the form of a money order, a certified check, a cashier's check, or an irrevocable letter of credit issued to Manatee County. NOTE: A construction project over $200,000 requires a Bid Bond in the amount of 5% of the total bid offer.

☐ **Payment and Performance Bond**
A Payment and Performance Bond shall be submitted by Successful Bidder for 100% of the award amount and shall be presented to Manatee County within ten (10) calendar days of issuance of the notice of intent to award. NOTE: A construction project over $200,000 requires a Payment and Performance Bond.

I. INSURANCE REQUIREMENTS

THE POLICIES ARE TO CONTAIN, OR BE ENDORSED TO CONTAIN, THE FOLLOWING PROVISIONS:

Commercial General Liability and Automobile Liability Coverages

a. **"Manatee County, a Political Subdivision of the State of Florida," is to be named as an Additional Insured in respect to:** Liability arising out of activities performed by or on behalf of the CONSULTANT, his agents, representatives, and employees; products and completed operations of the CONSULTANT; or automobiles owned, leased, hired or borrowed by the CONSULTANT. The coverage shall contain no special limitation(s) on the scope of protection afforded to the COUNTY, its officials, employees or volunteers.

   In addition to furnishing a Certificate of Insurance, the CONSULTANT shall provide the endorsement that evidences Manatee COUNTY being listed as an Additional Insured. This can be done in one of two ways: (1) an endorsement can be issued that specifically lists "Manatee County, a Political Subdivision of the State of Florida," as Additional Insured; or, (2) an endorsement can be issued that states that all Certificate Holders are Additional Insured with respect to the policy.

b. The CONSULTANT'S insurance coverage shall be primary insurance with respect to the COUNTY, its officials, employees and volunteers. Any insurance or self-insurance maintained by the COUNTY, its officials, employees or volunteers shall be excess of CONSULTANT's insurance and shall be non-contributory.

c. The insurance policies must be on an occurrence form.

Workers' Compensation and Employers' Liability Coverages

The insurer shall agree to waive all rights of subrogation against the COUNTY, its officials, employees and volunteers for losses arising from work performed by the CONSULTANT for the COUNTY.

II. General Insurance Provisions Applicable To All Policies:

a. Prior to the execution of contract, or issuance of a Purchase Order, and then annually upon the anniversary date(s) of the insurance policy's renewal date(s) for as long as this contract remains in effect, CONSULTANT shall furnish the COUNTY with a Certificate(s) of Insurance (using an industry accepted certificate form, signed by the Issuer, with applicable endorsements, and containing the solicitation or contract number, and title or description) evidencing the coverage set forth above and naming

"Manatee County, a Political Subdivision of the State of Florida" as an Additional Insured on the applicable coverage(s) set forth above.

b. If the policy contains an aggregate limit, confirmation is needed in writing (letter, email, etc.) that the aggregate limit has not been eroded to procurement representative when supplying Certificate of Insurance.

In addition, when requested in writing from the COUNTY, CONSULTANT will provide the COUNTY with a certified copy of all applicable policies. The address where such certificates and certified policies shall be sent or delivered is as follows:

Manatee County, a Political Subdivision of the State of Florida
Attn: Risk Management Division
1112 Manatee Avenue West, Suite 969
Bradenton, FL 34205

c. The project's solicitation number and title shall be listed on each certificate.

d. CONSULTANT shall provide thirty (30) days written notice to the Risk Manager of any cancellation, non-renewal, termination, material change, or reduction in coverage of any insurance policies to procurement representative including solicitation number and title with all notices.

e. CONSULTANT agrees that should at any time CONSULTANT fail to meet or maintain the required insurance coverage(s) as set forth herein, the COUNTY may terminate this contract.

f. The CONSULTANT waives all subrogation rights against COUNTY, a Political Subdivision of the State of Florida, for all losses or damages which occur during the contract and for any events occurring during the contract period, whether the suit is brought during the contract period or not.

g. The CONSULTANT has sole responsibility for all insurance premiums and policy deductibles.

h. It is the CONSULTANT'S responsibility to ensure that his agents, representatives and subcontractors comply with the insurance requirements set forth herein. CONSULTANT shall include his agents, representatives, and subcontractors working on the project or at the worksite as insured under its policies, or CONSULTANT shall furnish separate certificates and endorsements for each agent, representative, and subcontractor working on the project or at the worksite. All coverages for agents, representatives, and subcontractors shall be subject to all of the requirements set forth to the procurement representative.

i. All required insurance policies must be written with a carrier having a minimum A.M. Best rating of A- FSC VII or better. In addition, the COUNTY has the right to review

the CONSULTANT's deductible or self-insured retention and to require that it be reduced or eliminated.

j. CONSULTANT understands and agrees that the stipulated limits of coverage listed herein in this insurance section shall not be construed as a limitation of any potential liability to the COUNTY, or to others, and the COUNTY'S failure to request evidence of this insurance coverage shall not be construed as a waiver of CONSULTANT'S obligation to provide and maintain the insurance coverage specified.

k. CONSULTANT understands and agrees that the COUNTY does not waive its immunity and nothing herein shall be interpreted as a waiver of the COUNTY'S rights, including the limitation of waiver of immunity, as set forth in Florida Statutes § 768.28, or any other statutes, and the COUNTY expressly reserves these rights to the full extent allowed by law.

l. No award shall be made until the Procurement Division has received the Certificate of Insurance in accordance with this section.

III. BONDING REQUIREMENTS

Bid Bond/Certified Check. By submitting a proposal, the CONSULTANT agrees should its proposal be accepted, **to execute the form of Agreement and present the same to COUNTY for approval within ten (10) calendar days after notice of intent to award**. The CONSULTANT further agrees that failure to execute and deliver said form of Agreement **within ten (10) calendar days** will result in damages to COUNTY and as guarantee of payment of same a bid bond/certified check shall be enclosed within the submitted sealed proposal in the amount of five (5%) percent of the total amount of the proposal. The CONSULTANT further agrees that in case the CONSULTANT fails to enter into an Agreement, as prescribed by COUNTY, the bid bond/certified check accompanying the proposal shall be forfeited to COUNTY as agreed liquidated damages. If COUNTY enters into an agreement with a CONSULTANT, or if COUNTY rejects any and/or all proposals, accompanying bond will be promptly returned.

Payment and Performance Bonds. Prior to commencing work, the CONSULTANT shall obtain, for the benefit of and directed to COUNTY, a Payment and Performance Bond satisfying the requirements of Florida Statutes § 255.05 covering the faithful performance by the CONSULTANT of its obligation under the Contract Documents, including but not limited to the construction of the project on the project site and the payment and obligations arising thereunder, including all payments to Subcontractors, laborers, and materialmen. The surety selected by the CONSULTANT to provide the Payment and Performance Bond shall be approved by COUNTY prior to issuance of such Bond, which approval shall not be unreasonably withheld or delayed provided that surety is rated A- or better by Best's Key Guide, latest edition.

Failure to provide the required bonds on the prescribed form may result in CONSULTANT being deemed nonresponsive. Bonds must be in the form prescribed in Florida Statutes § 255.05 and must not contain notice, demand or other terms and conditions, including informal pre-claim meetings, not provided for in Florida Statutes § 255.05.

Bonds shall be in an amount equal to 100% of the contract price issued by a duly authorized and nationally recognized surety company, authorized to do business in the State of Florida, satisfactory to COUNTY. Surety shall be rated as "A-" or better by Best's Key Guide, latest edition. The attorney-in-fact who signs the bonds must file with the bonds, a certificate and effective dated copy of power-of-attorney. Payment and Performance Bonds shall be issued to "Manatee County, a political subdivision of the State of Florida", **within ten (10) calendar days after issuance of notice of intent to award**.

In addition, pursuant to Section 255.05(1)(b), Florida Statutes, prior to commencing work, the CONSULTANT shall be responsible and bear all costs associated to record the Payment and Performance Bond with the Manatee County Clerk of the Circuit Court. A certified copy of said recording shall be furnished to the Procurement Division upon filing. Pursuant to Florida Statutes § 255.05(1)(b) COUNTY will make no payment to the CONSULTANT until the CONSULTANT has complied with this paragraph.

Furnishing Payment and Performance Bonds shall be requisite to execution of an Agreement with COUNTY. Said Payment and Performance Bonds will remain in force for the duration of this Agreement with the premiums paid by the CONSULTANT. Failure of the CONSULTANT to execute such Agreement and to supply the required bonds shall be just cause for cancellation of the award. COUNTY may then contract with the next lowest, responsive and responsible CONSULTANT or re-advertise the RFP.

Failure of COUNTY at any time to require performance by the CONSULTANT of any provisions set out in the resulting Agreement will in no way affect the right of COUNTY, thereafter, to enforce those provisions.

[Remainder of page intentionally left blank]

CONSULTANT'S INSURANCE STATEMENT

THE UNDERSIGNED has read and understands the aforementioned insurance and bond requirements of this Agreement and shall provide the insurance and bonds required by this section within ten (10) days from the date of notice of intent to award.

Date: _____

Consultant's Name: _____

Authorized Signature: _____

Printed Name/Title: _____

Insurance Agency: _____

Agent Name: _____

Agent Phone: _____

Surety Agency: _____

Surety Name: _____

Surety Phone: _____

Please return this completed and signed statement with your agreement.